Repair Manual

Jetta 2011 ➤ , Touareg 2010 ➤ ,
Golf 2013 ➤ , e-up! 2014 ➤ ,
e-Golf 2014 ➤ , Golf Variant 2014 ➤ ,
Passat 2015 ➤ , Passat Variant 2015 ➤ ,
Touareg 2015 ➤ , e-up! 2017 ➤ ,
Golf 2017 ➤ , e-Golf 2017 ➤ ,
Touareg 2018 ➤ , e-Crafter 2019 ➤ ,
Passat 2019 ➤ , Passat Variant 2019 ➤ ,
Golf 2020 ➤ , e-up! 2020 ➤ ,
Arteon 2021 ➤ ,
Arteon Shooting Brake 2021 ➤ ,
Tiguan 2021 ➤ , Multivan 2022 ➤

High-Voltage System - General Information									
Engine ID	CUKC	CUKB	DGEA	DGEB	CNLA	CRJA	EAGA	EAZA	EABA
	CGEA	CGFA	EBSA	EBMA	DFKA	DGEB	EBJA	EBJC	EBJD
	EBHA								

Edition 08.2024

List of Workshop Manual Repair Groups

Repair Group

00 - General, Technical Data

93 - Electric Drive

Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

Contents

00 – General, Technical Data

1 Safety Precautions

(Edition 08.2024)

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1.1 Safety Precautions when Working on Vehicles with High-Voltage System

High voltage is extremely dangerous.

The high-voltage system is under high voltage. Electrocution can cause death or very serious personal injury.

– Individuals with electronic/medical life and health sustaining machines in or on their person cannot perform any work on high-voltage systems. Life and health sustaining machines are for example pain killer pumps, implanted defibrillators, pacemakers, insulin pumps, and hearing aids.

– Have the high-voltage system de-energized by a qualified person.

There is a risk of injury due to the engine starting unexpectedly.

Active drive ready mode is difficult to identify in electric and hybrid vehicles. Parts of the body can be pinched or pulled in.

– Switch off the ignition.

– Place the ignition key outside of the vehicle interior.

There is a risk of damaging the high-voltage cables.

Incorrect handling can damage the insulation on high-voltage cables or high-voltage connectors.

– Never use the high-voltage cables and the high-voltage connectors for support.

– Never support tools on the high-voltage cables and the high-voltage connectors.

– Never sharply bend or kink the high-voltage cables.

– Pay attention to the coding when connecting the high-voltage connectors.

1.2 Safety Precautions when Working near High-Voltage Components

High voltage is extremely dangerous.

The high-voltage system is under high voltage. Electrocution can cause death or very serious personal injury from damaged high-voltage components and high-voltage cables.

– Visually inspect the high-voltage components and the high-voltage cables.

– Never use tools that are for cutting, deformed, or sharp edged.

– Never weld, solder, or use thermal adhesive or hot air.

1.3 Safety Precautions during Road Tests with Testing Equipment

There is a risk of injury from unsecured testing equipment.

If the front passenger airbag activates during a collision, unsecured testing equipment becomes a dangerous projectile.

– Secure testing equipment on the rear seat.

or

– Have a second person operate testing equipment on the rear seat.

1.4 Safety Precautions when Working on the Cooling System

There is a risk of scalding due to hot coolant.

The cooling system is under pressure when the engine is warm. There is a risk of scalding due to hot steam and hot coolant.

– Wear safety gloves.

– Wear protective eyewear.

– Reduce the pressure by covering the coolant expansion tank cap with a cloth and carefully opening it.

2 Repair Information

2.1 Contact Corrosion

Contact corrosion can occur if incorrect fasteners (bolts, nuts, washers, etc.) are used.

For this reason, only fasteners with a special surface coating may be installed.

Furthermore, only rubber/plastic parts and adhesives made materials that do not conduct electricity are used.

If there are doubts as to whether parts are suitable or not, use new parts. Refer to the ⇒ Electronic Parts Catalog (ETKA) .

Note

- Only use original replacement parts that have been tested and are compatible with aluminum.
- Use only Volkswagen accessories.
- Contact corrosion damage is not covered under warranty.

2.2 Line Routing and Securing

- Wires should be marked before they are removed to prevent confusing them and to guarantee the installation position. This also includes fuel lines, hydraulic lines, vacuum lines, EVAP systems and electrical lines. Draw sketches or take pictures of them if needed.
- Due to the limited space inside the engine compartment, allow sufficient clearance to all moving or hot parts to avoid damaging the lines.

2.3 Cleanliness Guidelines when Working on the High-Voltage System

Carefully follow the guidelines for clean working conditions when working on the high-voltage system:

- Thoroughly clean the connection points/maintenance openings and the surrounding area before loosening/opening.
- Place the removed parts on a clean surface and cover them. Only use lint-free cloths.
- Carefully cover or seal opened components if the repair is not performed immediately.
- Install only clean components.
- Remove the replacement parts from their packaging just prior to installing them.
- Do not use parts that have been loosely stored or unpackaged (for example, in tool boxes etc.).
- Remove any transport or protective packaging and covers just before installing the component.
- Do not work with compressed air when the system is open. Do not move the vehicle.

93 – Electric Drive

1 High-Voltage System Danger Classification

1.1 General Information

DANGER

The high-voltage system and the high-voltage battery of the vehicle are dangerous and can cause burns, other injuries or a deadly electric shock.

- **Procedures involving the high-voltage system and other systems which are directly affected by this system, must only be performed by appropriately qualified and trained professionals.**
- **The designated importer is to be contacted if there are any questions or unclear matters regarding the terms “high-voltage technician”, “high-voltage expert” or regarding the high-voltage system, before beginning any work involving the high-voltage system.**
- **The following must be considered during repair operations: the applicable legal regulations, other legal provisions, the recognized engineering guidelines, any applicable accident prevention regulations (in Germany including but not limited to DGUV Information 200-005 - Qualification for working on vehicles with high-voltage system) and this repair manual.**

Before beginning work on the high-voltage system, a high-voltage technician must de-energize the high-voltage system.

For a list of procedures that require the high-voltage system to be de-energized refer to the list “High-Voltage System Procedures” in the vehicle-specific manual.

Observe the following precautions when working on the high-voltage system:

- Only the high-voltage technician is authorized with the high-voltage system certification to de-energize.
- Only persons who are at least qualified as a technician trained in electrical systems are allowed to work on the high-voltage system.
- Perform a visual inspection of the high-voltage relevant components in the procedure/work area during every procedure.
- Do not excessively bend or flex high-voltage cables.
- A high-voltage technician or a high-voltage expert must be contacted if there are abnormalities or if something is not clear.
- Working near high-voltage components and high-voltage cables with cutting, deforming, sharp-edged tools or with heat-generating sources, such as welding, soldering, hot air, thermal adhesive and infrared dryer, is forbidden. If this is the case, the high-voltage system must be de-energized and the applicable components must be removed or sufficiently protected.

- All the work described refers to the removal and installation or the replacement of individual components.
- For safety reasons, the following procedures must not be performed during the charging process.
- Procedures that extend the charging process.
- Procedures for which the vehicle must be de-energized corresponding to the subsequent danger classification.
- Procedures that require the vehicle to move or during which cables and connectors could be pulled.
- Procedures which increase the risk of tripping or injury from the connected charging cable.
- Procedures where the charging cable could block work paths and/or emergency exits.
- Procedures on the 12 V battery.
- The high-voltage system must be disabled when performing a regularly scheduled Maintenance service.

Note

- *The danger classification can vary depending on the vehicle model.*
- *Refer to the vehicle-specific manual for the vehicle-specific information.*

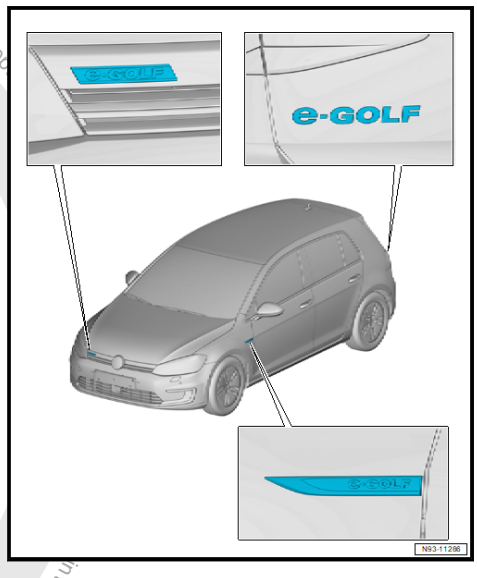
1.2 Training/Personnel Qualification

Volkswagen Qualification	DGUV-I 200-005	Application
Technician trained in electrical systems	1 S	Training for non-electrotechnical procedures (< 60 VDC)
high-voltage technician	2 S	Working on intrinsically safe high-voltage production vehicles ♦ Vehicles are certified to be completely de-energized. ♦ Complete contact protection present.
High-voltage expert	3 S	Working with the high-voltage components energized ♦ Working on live components that do not have the necessary contact protection in order to perform Fault Finding, replace components, etc.

2 Identifying Features of High-Voltage Vehicles

High-voltage vehicles can be identified using the following features.

Type designation plate outer front, side and rear

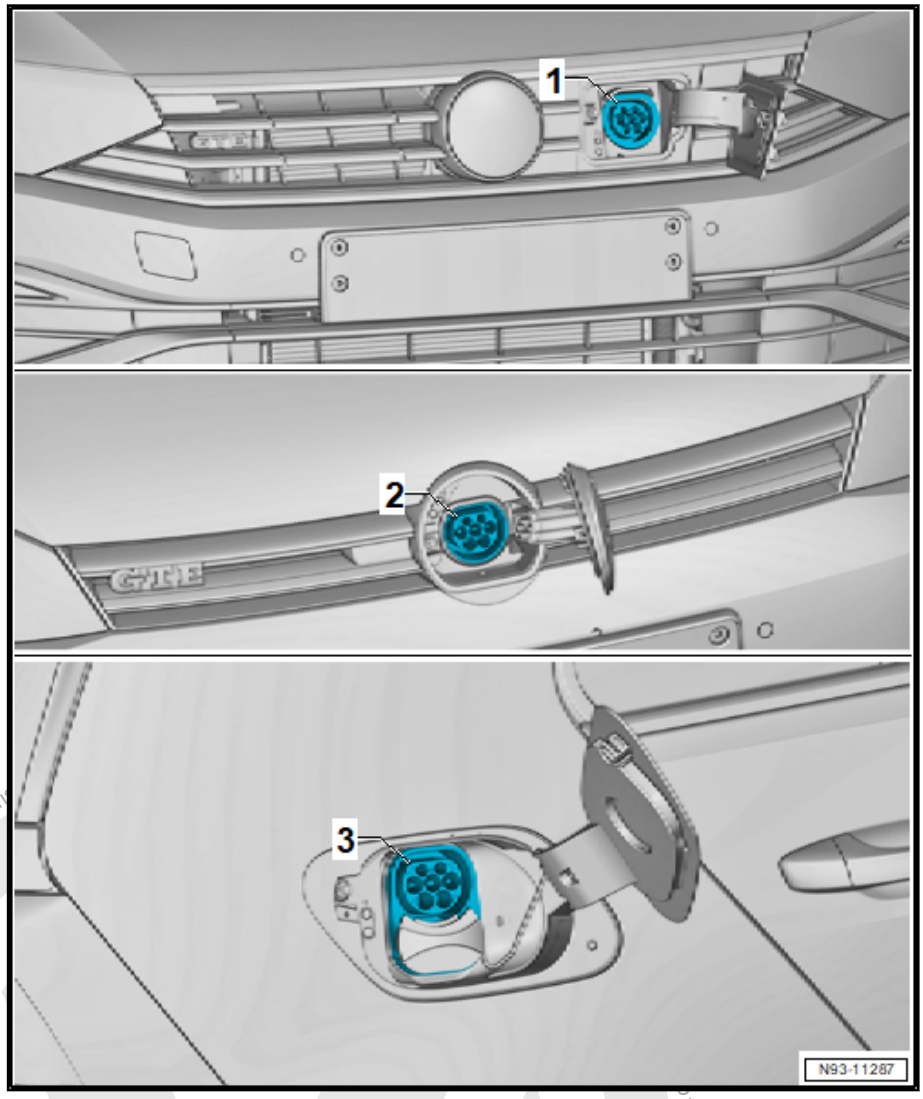


Possible charging socket component locations

1 - Near the Brand Emblem

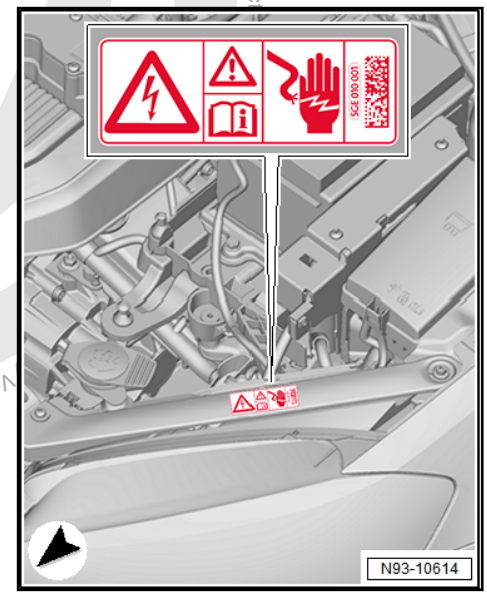
2 - Behind the Brand Emblem

3 - Behind the Fuel Filler Door

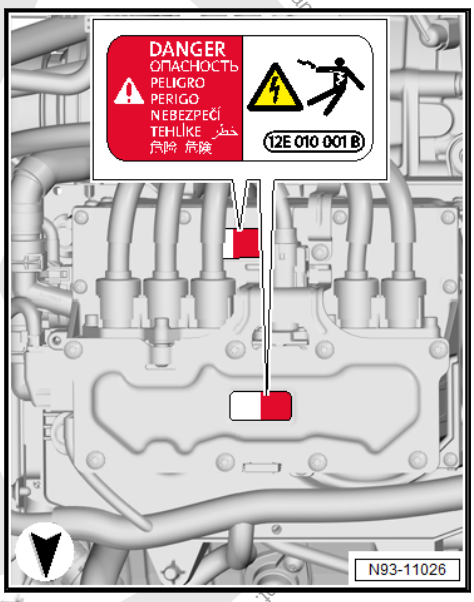


Danger markings in the engine and passenger compartment

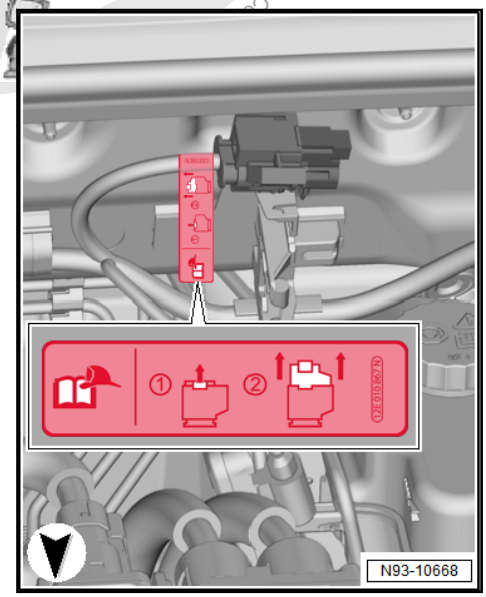
Front left lock carrier



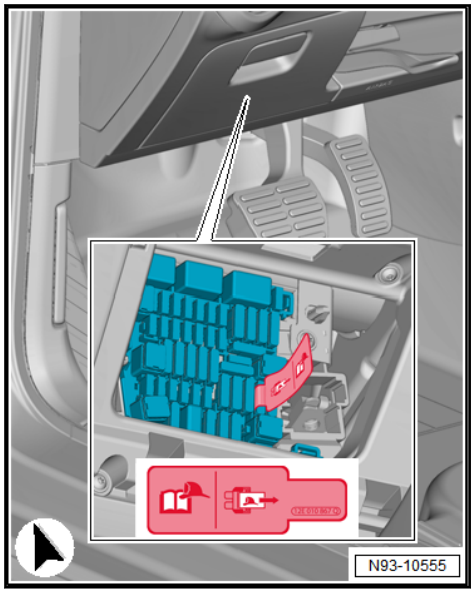
Engine/motor compartment on the Electric Drive Power and Control Electronics - JX1-



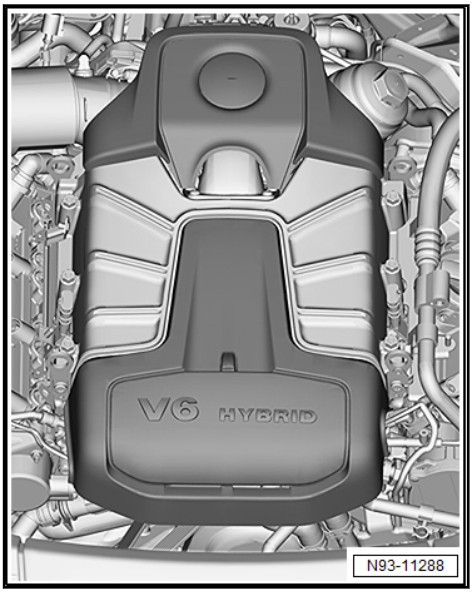
Engine compartment rescue instructions on the plenum chamber bulkhead



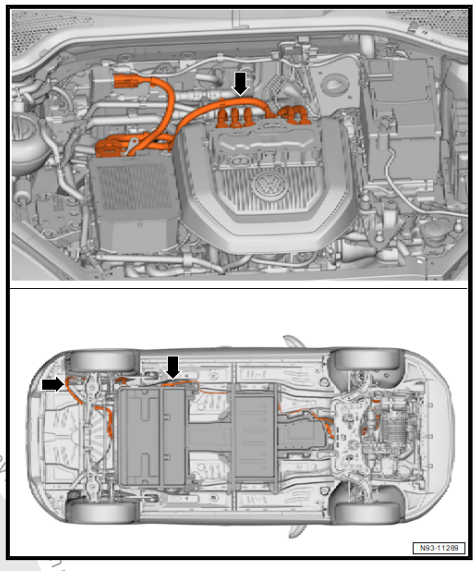
Vehicle interior rescue instructions under the instrument panel on the fuse panel



Type identification in the engine/motor compartment on the design cover of the engine.



Orange color high-voltage cables for example in the engine/motor compartment and underbody



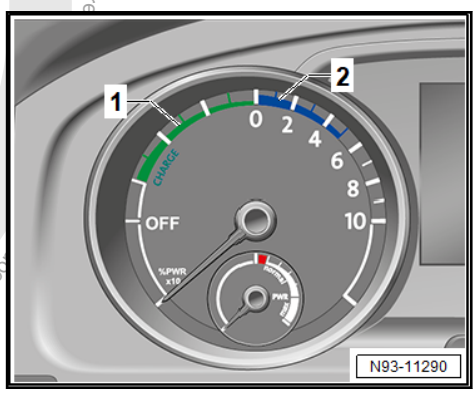
Note

- *The high-voltage system cables are distinctively different from the cables for the vehicle electrical system and the 12 V electrical system.*
- *Because of the high voltage and current strengths, they have a distinctly larger cross section and are connected via special connector terminals. The high-voltage system does not provide electric potential to the body like the 12 volt vehicle electrical system.*
- *To make the danger of high voltage noticeable, all of the high-voltage system cables are colored completely in orange.*
- *The high-voltage cables are protected against polarity reversal. They cannot be installed incorrectly, since they are both color and mechanically coded.*
- *Near the colored identification there are warnings about damage to the high-voltage components.*

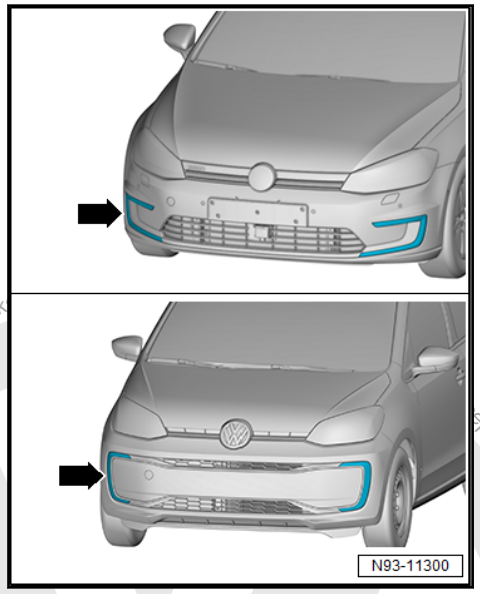
Special displays in the instrument cluster

1 - Charge

2 - Ready



LED - design module in the bumper for example for e-up! and e-Golf



3 High-Voltage Vehicles, Handling

3.1 Personal Protective Equipment

Note

Use cases can found in the vehicle-specific manual.

Refer to the ⇒ Electronic Parts Catalog (ETKA) for the following protective equipment.

- Protective Footwear
- High-Voltage Expert Coat
- High-Voltage Expert Helmet
- High-Voltage Expert Visor
- High-Voltage Expert Protective Hood
- High-Voltage Expert Gloves
- High-Voltage Expert Under Gloves
- High-Voltage Expert Jacket
- High-Voltage Expert Pants
- High-Voltage Expert Protective Suit

Refer to the ⇒ Electronic Parts Catalog (ETKA) for the size and order numbers.

3.2 Workshop Procedures for High-Voltage Vehicles

3.2.1 Workshop Procedures for Technician Trained in Electrical Systems

	Action
1.	Smoke production? Brand? Did fluid enter the high-voltage battery? High-voltage battery damaged or altered? If yes: ◆ If possible, securely store the vehicle according to the quarantine concept. Refer to ⇒ “4 Quarantine Concept”, page 15 . ◆ Assign to the high-voltage technician and give over the responsibility. Refer to ⇒ “3.2.2 Workshop Procedures for High-Voltage Technician”, page 12 . If no:

	Action
	♦ Continue with 2
2.	Mark the vehicle as “High-Voltage Vehicle”.
3.	Airbag or seat belt tensioner deployed? If yes: ♦ Securely store the vehicle according to the quarantine concept. Refer to ⇒ “4 Quarantine Concept”, page 15 . ♦ Assign to the high-voltage technician and give over the responsibility. Refer to ⇒ “3.2.2 Workshop Procedures for High-Voltage Technician”, page 12 . If no: ♦ Continue with 4
4.	Switch the ignition on.
5.	Is the high-voltage warning lamp in the instrument cluster on? If yes: ♦ Assign to the high-voltage technician and give over the responsibility. Refer to ⇒ “3.2.2 Workshop Procedures for High-Voltage Technician”, page 12 . If no: ♦ Continue with 6
6.	De-energizing necessary? If yes: ♦ Assign to the high-voltage technician and give over the responsibility. Refer to ⇒ “3.2.2 Workshop Procedures for High-Voltage Technician”, page 12 . If no: ♦ Continue with 7
7.	Turn off the ignition.
8.	Visual inspection of the high-voltage components and cable in the work area OK? If no: ♦ Assign to the high-voltage technician and give over the responsibility. Refer to ⇒ “3.2.2 Workshop Procedures for High-Voltage Technician”, page 12 . If yes: ♦ Continue with 9
9.	Maintenance and servicing of standard components according to the repair manual
	Exchanging the high-voltage components / servicing near the high-voltage components according to the repair manual After exchanging, re-energize the high-voltage system: ♦ Assign to the high-voltage technician and give over the responsibility. Refer to ⇒ “3.2.2 Workshop Procedures for High-Voltage Technician”, page 12 .

3.2.2 Workshop Procedures for High-Voltage Technician

With product technician

	Action
1.	Visual inspection and diagnostic of the vehicle, high-voltage system/high-voltage battery

	Action
2.	High-voltage battery classification necessary? If yes: ◆ High-voltage battery classification. Refer to ⇒ “6.1 High-Voltage Battery Classification”, page 22 . If no: ◆ De-energizing certification. Refer to ⇒ “3.2.4 De-Energizing Certification”, page 14 .
3.	High-voltage battery quarantine necessary? If yes: ◆ Securely store the vehicle according to the quarantine concept. Refer to ⇒ “4 Quarantine Concept”, page 15 . ◆ Assign to the high-voltage expert give over the responsibility. Refer to ⇒ “3.2.3 Workshop Procedures for High-Voltage Expert”, page 13 . If no: ◆ De-energizing certification. Refer to ⇒ “3.2.4 De-Energizing Certification”, page 14 .
4.	Visual inspection of the high-voltage components and cable in the work area
5.	Servicing the high-voltage component? If no: ◆ Assign to the technician trained in electrical systems, the responsibility belongs to the high-voltage technician. Refer to ⇒ “3.2.1 Workshop Procedures for Technician Trained in Electrical Systems”, page 11 . If yes: ◆ Continue with 6
6.	Servicing high-voltage components - de-energized or contact protected? If no: ◆ Assign to the high-voltage expert give over the responsibility. Refer to ⇒ “3.2.3 Workshop Procedures for High-Voltage Expert”, page 13 . If yes: ◆ Continue with 7
7.	High-voltage component removing and servicing according to the repair manual
8.	High-voltage component installing in vehicle
9.	High-Voltage System, Re-Energizing

3.2.3 Workshop Procedures for High-Voltage Expert

	Action
1.	High-voltage battery classification. Refer to ⇒ “6.1 High-Voltage Battery Classification”, page 22 .
2.	De-energizing certification. Refer to ⇒ “3.2.4 De-Energizing Certification”, page 14 .
3.	High-voltage system switched off and secured
4.	If necessary, remove the high-voltage battery, packaging and establish transportability

	Action
5.	High-voltage component removing and servicing according to the repair manual ◆ Assign to the high-voltage technician and give over the responsibility. Refer to ⇒ “3.2.2 Workshop Procedures for High-Voltage Technician”, page 12 .

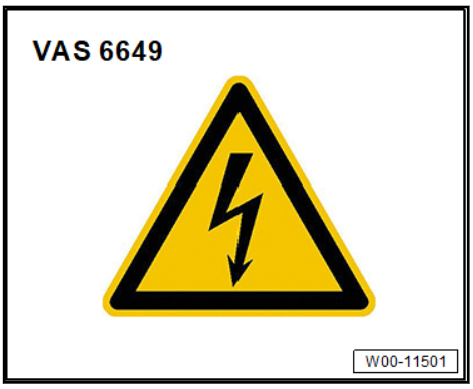
3.2.4 De-Energizing Certification

	Procedure for high-voltage technician	Procedure for high-voltage expert
1.	De-energize the system	De-energize the system
2.	Secure the system so that it cannot be energized again	Secure the system so that it cannot be energized again
3.	De-energized determined? If no: ◆ Assign to the high-voltage expert give over the responsibility. Refer to ⇒ “3.2.3 Workshop Procedures for High-Voltage Expert”, page 13 . If yes: ◆ Continue with 4. Refer to ⇒ “3.2.2 Workshop Procedures for High-Voltage Technician”, page 12 .	De-energized determined? If no: ◆ High-voltage system switched off and secured. Refer to ⇒ “3.2.3 Workshop Procedures for High-Voltage Expert”, page 13 . If yes: ◆ Continue with 4. Refer to ⇒ “3.2.3 Workshop Procedures for High-Voltage Expert”, page 13 .

4 Quarantine Concept

Special tools and workshop equipment required

- Warning Sign - High Voltage - VAS 6649-



- Warning Sign - "Do Not Enter" - VAS 6881-

- Warning Sign - "No Open Flames" - VAS 6882-

- Warning Sign - Battery - VAS 6786-

- Temperature Gauge (Infrared) - VAS 6886-

Handling Accident-Damaged High-Voltage Vehicles

DANGER

For very damaged high-voltage batteries or in case of doubt the diagnostic can be performed after contacting the high-voltage expert.

Note

- *Inform the high-voltage technician (HVT), when a high-voltage vehicle is brought to the dealership which is faulty or has been in a collision.*
- *Unload vehicles with a high-voltage battery only on a suitable area.*
- *Service partners must immediately make contact to the next nearest high-voltage service partner or importer.*
- *Label high-voltage vehicles with the Warning Sign - High Voltage - VAS 6649- . In the case of quarantine additional labels are necessary.*
- *Secure the high-voltage vehicle so that unauthorized persons cannot get access to the vehicle.*
- *Protect heavily damaged vehicles and removed high-voltage batteries from rain and humidity.*

Concept to set up a quarantine area

The use of a sealed base plate is recommended.

1 - VAS 6786 Warning Sign - »Battery«

2 - VAS 6649 Warning Sign - »High Voltage«

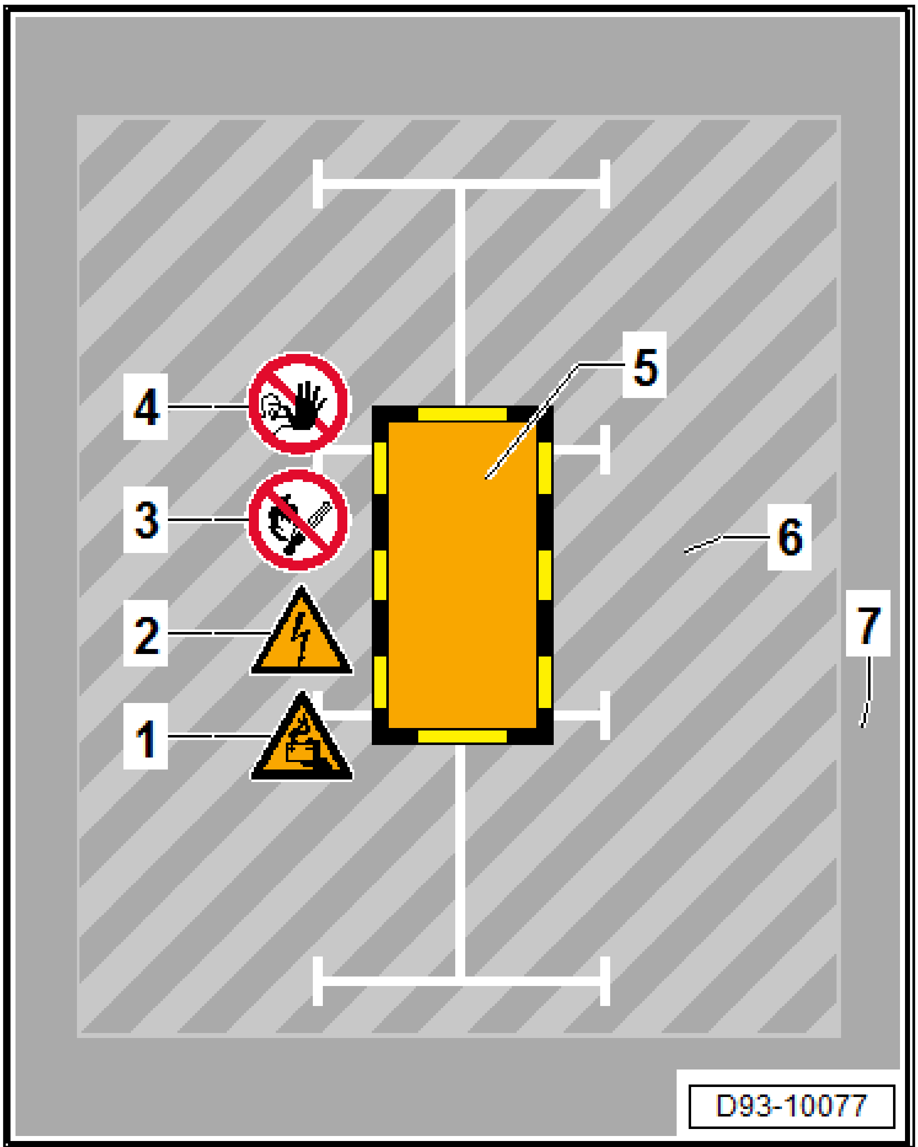
3 - VAS 6882 Warning Sign - »No Open Flames«

4 - VAS 6881 Warning Sign - »Do Not Enter«

5 - Hazard Designation Placement Area

6 - Outside of the safety zone

7 - Suitable open space, for example parking space surface.



Additional procedure

– Account for the complaints registration in DISS.

– Visually inspect the damaged vehicles and assess their danger potential with the following evaluation criteria.

• Use the Temperature Gauge (Infrared) - VAS 6886- for temperature measurement.

Assessment criteria	Meaning
Signs of a fire	• If at least one of the evaluation criteria is met: Attention Danger! Follow measure a) • If no evaluation criteria is met, then continue with b)
Sparks, smoke or steam	
Unusual noises from inside of the high-voltage battery, for example crackling or hissing.	
Pungent odor	
Fluid leaking, suspicion of fluids in the high-voltage battery system.	
Mechanical damages with open and accessible contacts/conductors.	

Assessment criteria	Meaning
Accessibility to high-voltage batteries for temperature measurements, for example due to missing or damaged body components, surface temperature of the high-voltage battery is higher than 80 °C (176 °F).	

a) Pay attention to the following measures for “Attention Danger”:
Keep a safe distance.
Monitor the high-voltage vehicle/high-voltage battery.
Be prepared to extinguish flames and immediately call the fire department and evacuate the building if there are signs of a starting fire.
Do not breath in any smoke. Wear a respirator.
For mechanical damage of the high-voltage battery with open accessible contacts/conductors, do not touch the vehicle and high-voltage battery.
If possible, transfer the high-voltage vehicle/high-voltage battery into quarantine.
Secure the area while making sure there is enough space around it and inform those responsible according to the reporting processes
Use the personal safety equipment.

b) if the vehicle which has been damaged during an accident can be classified as not dangerous according to the assessment criteria, the following steps must be performed:
High-Voltage Battery Classification. Refer to ⇒ “6.1 High-Voltage Battery Classification”, page 22 .

Note

- *If possible, perform the steps outside of any building or on another suitable area.*
- *Servicing the 12V vehicle electrical system may be necessary to run diagnostics on it.*

5 High-voltage Vehicles Involved in a Collision, Assessing

⇒ “5.1 General information about Assessing Vehicles Involved in a Collision”, page 19

⇒ “5.2 Photo Documentation”, page 19

5.1 General information about Assessing Vehicles Involved in a Collision

Quality of documentation is important for evaluating damage to the battery housing lower section. Recommendations on which procedures to use, are based on the position and depth of the damage:

- Paint repair
- Battery Housing Lower Section, Replacing
- High-Voltage Battery Components, Replacing

5.2 Photo Documentation

Special tools and workshop equipment required

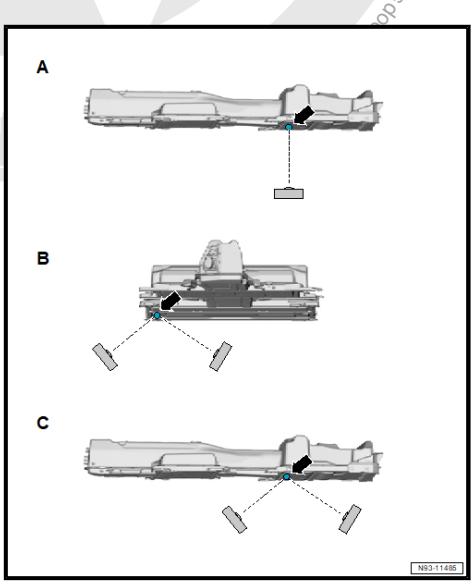
- Photo Camera
- Tape
- Digital Depth Gauge
- Tape Measure

Procedure

– Determine the classification of the lithium-ion high-voltage battery using ODIS. Refer to ⇒ “6.1 High-Voltage Battery Classification”, page 22 .

– Remove the rear center underbody trim panel. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Underbody Trim Panel; Underbody Trim Panels, Removing and Installing .

– Clean the damaged locations carefully.



– Mark the outline of the dent or damage exactly with a pen.

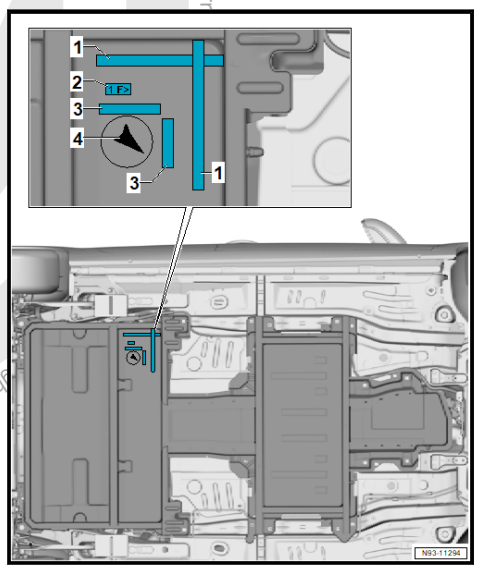
- The adhesive marking strips for the photo documentation, shown in the following, must be applied to the battery housing lower section. A drawing is not sufficient.
- The direction of travel must be apparent on each photo.
- If he battery housing lower section has more than one area of damage, number the areas.

– Mark the damaged area -4- with an adhesive strip -1- through -3-.

♦ Adhesive strips -1- for the length and width of the damaged area.

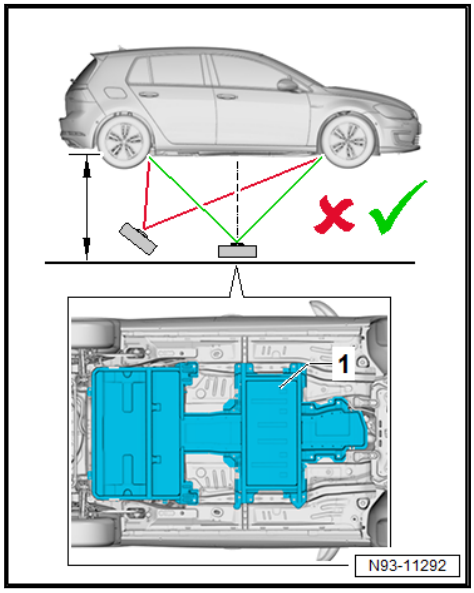
♦ Adhesive strips -2- labeled "F->" designating the direction of travel.

♦ Adhesive strips -3- for the location of the deepest spot.

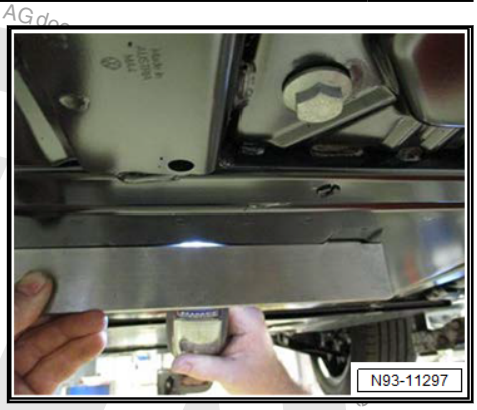


– Align the camera parallel to the battery housing lower section -1-.

– To gain a better overview, also take a photo of the entire battery housing lower section. If larger areas are affected, take several photos.



– Hold the Straight Edge - 500mm - VAS 6075- above the dent.
– Use a flashlight to brighten the area.



– Measure the depth of the dent using a Digital Depth Gauge .
– Take a picture of the measurement.

6 High-Voltage Battery

6.1 High-Voltage Battery Classification

6.1.1 High-Voltage Battery Classification, Basic Principles

The installed high-voltage batteries are highly complex components and systems, which may be affected by faults, defects or partial defects during their service life.

The high-voltage battery may get damaged during accidents.

High-voltage batteries contain materials which are classified as hazardous.

The condition of the high-voltage battery affects the following service requirements and work shop processes:

- Specific qualification requirements for service team members: technician trained in electrical systems, high-voltage technician and high-voltage expert.
- Repairability of the high-voltage battery.
- Packaging and transportation process for high-voltage batteries.
- Quarantine and reporting processes that need to be completed

• In order to assess the hazardous potential of the high-voltage battery, classify it.

The high-voltage battery can be assigned to one of three states:

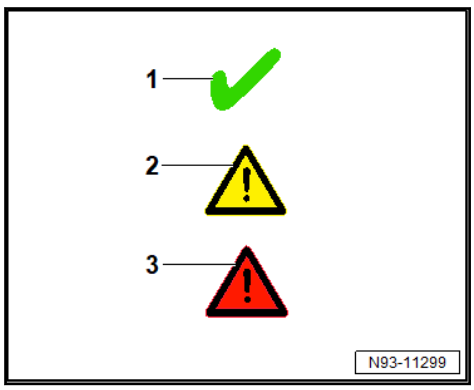
1 - “NORMAL”, not critical: no necessary measures to be taken.

2 - m“WARNING”, critical: ignoring the recommended procedures and measures can lead to serious injuries and/or death.

3 - “DANGER”, dangerous: ignoring the recommended procedures and measures will lead to serious injuries and/or death.

– Perform assessment using the classification matrix.

Classification matrix



Assessment criteria			Classification
Optical, sensory	Function, electric	Thermal	
♦ No relevant mechanical damage. ♦ No fluids leaking.	♦ High-voltage battery is diagnostic-capable. ♦ No relevant entries in the DTC memory.	♦ Temperature within the tolerance.	♦ NORMAL Not critical: no actions can be taken.
Fulfillment of ALL criteria results in the “NORMAL” classification→			
♦ Relevant mechanical damage, for example dents, cracks, openings and faulty seals. ♦ Corrosion damage. ♦ Pungent odor.	♦ High-voltage battery is not diagnostic-capable. ♦ Relevant entries in the DTC memory.	♦ Temperature above the tolerance.	♦ WARNING Critical: ignoring the recommended procedures and measures can lead to serious injuries and/or death.
Fulfillment of ONE criteria results in the “WARNING” classification→			
♦ Fluid leaking, suspicion of fluids in the high-voltage battery system. ♦ Sparks, smoke or steam. ♦ Signs of a fire. ♦ Unusual noises in the inside of the high-voltage battery, for example crackling or hissing. ♦ Mechanical damage with open and accessible contacts/conductors. ♦ Accessibility to high-voltage batteries for temperature measurements, for example due to missing or damaged body components, surface temperature of the high-voltage battery is higher than 80 °C (176 °F).		♦ Temperature ≥ 80° C	♦ DANGER Danger: ignoring the recommended procedures and measures can lead to serious injuries and/or death.
Fulfillment of ONE criteria results in the “DANGER” classification→			

Action matrix

Classification	Immediate action	Additional actions and processes		
		Servicing according to the repair manual	Temporary storage/quarantine	Packaging and transport

NORMAL	♦ Not necessary.	♦ Servicing, if necessary.	Temporary storage ♦ Original packaging ♦ Not stacked, on perfectly flat surface. ♦ Inside or water-protected outside area.	♦ Original packaging
WARNING	♦ Quarantine ♦ Bring outside or in the quarantine area/quarantine room. ♦ Use the personal safety equipment.	♦ Disposal and servicing are not possible ♦ Transfer in a noncritical condition is possible for example by servicing.	♦ Inform those responsible according to the reporting processes. ♦ Transfer the high-voltage vehicle/high-voltage battery over to a suitable surface outside ♦ Protect the removed high-voltage battery from humidity.	♦ Special transport box necessary (if necessary disassembling is required). ♦ Packaging should only be performed by trained persons.
Additional procedures should be coordinated by the high-voltage expert				

DANGER	♦ Keep a safe distance ♦ Monitor the high-voltage vehicle/high-voltage battery. ♦ Be prepared to extinguish flames and immediately call the fire department and evacuate the building if there are signs of a starting fire. ♦ Do not breath in any smoke. Wear a respirator. ♦ For mechanical damage of the high-voltage battery with open accessible contacts or conductors do not touch the vehicle and high-voltage battery. ♦ If possible, transfer the high-voltage vehicle/high-voltage battery into quarantine. ♦ Secure the area while making sure there is enough space around it and inform those responsible according to the reporting processes ♦ Use the personal safety equipment.	♦ Not relevant.	♦ Quarantine and if necessary call the fire department. ♦ Monitor the high-voltage vehicle/high-voltage battery.	♦ No packaging. ♦ No transport.

Progress of the classification

- The classification is software supported in the “Guided Function” via ODIS.
- This includes the measured values of the cell voltages and temperature sensors, the DTC memory is read out and the communication for the battery regulation control module is checked.
- The classification can be performed on vehicles with installed, as well as, removed high-voltage batteries.

- Only a high-voltage expert may re-classify the battery due to case specific evaluation.

Process description

Optical, sensory, functional, electric and thermal evaluation.	Criteria:
	1. Indication of a fire?
	2. Detectable sparks, smoke or steam be detected?
	3. Noises in the high-voltage battery, for example crackling?
	4. Pungent odor?
	5. Fluid leaking or the suspension of fluid leaking in the high-voltage battery system?
	6. Sever mechanical damage on the high-voltage battery?
	7. Temperature and cell voltage measurement
	8. Functionality test of the high-voltage battery?
↓	
Classification	NORMAL (not critical)
	WARNING (critical)
	DANGER (dangerous)

6.1.2 High-Voltage Battery Classification Using ODIS

Special tools and workshop equipment required

- Diagnostic Box - VAS 5581-

- Professional Diagnostics Laptop - VAS 6150E-
- With Diagnostic Box - Adapter Cable - VAS 5581/1-1-
- With Diagnostic Box - Adapter Cable - VAS 5581/3- or Diagnostic Box - Adapter Cable - VAS 5581/3A-
- With Diagnostic Box - Adapter Cable - VAS 5581/5-
- High Voltage Diagnostics Box -EU- - VAS 5581A-
- With Diagnostic Box - Adapter Cable - VAS 5581/3A-

Procedure

If the high-voltage battery is installed in the vehicle.

– Connect the ⇒ Vehicle diagnostic tester to the vehicle.

– Open ODIS.

– Continue with `start diagnostic`.

– In the window for manual entry of the vehicle base information select `manual`.
– Remove the check on the `working with Guided Fault Finding`.
– On control module list entry select “8C hybrid battery management”.

Start the options with a right click.

– Selection of `8C- Additional assessment`.
– Confirm with `run`.

Follow the additional instructions and questions of the condition assessment of the high-voltage battery to the end.

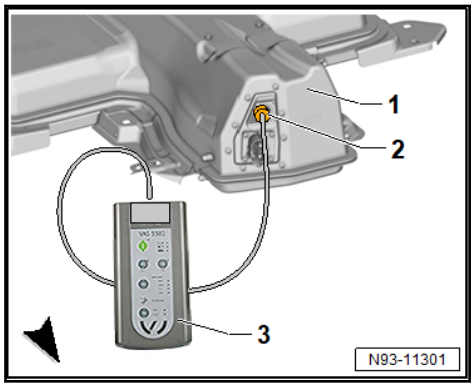
– Select `protocol`.
– Select `save`.
– Select `long protocol` in the dialog window.

Note

The long protocol includes the read out measured values.

– Confirm with `OK`.
– Store the log as an HTML file including the necessary files.

If the high-voltage battery is removed.



– Connect the Diagnostic Box - VAS 5581- -3- to the vehicle specific test adapter -2- on the high-voltage battery communication connector -1-.
– Switch on the Diagnostic Box - VAS 5581- -3-.
– Activate with terminal 15 F1.
– Activate with terminal 30 F2.
– Adjust the CAN-R select using F3 on “120-R”.
– Establish connection to the ⇒ Vehicle diagnostic tester via Diagnostics Interface W-LAN - VAS 6154A- or via a USB cable.

Note

- *Further procedures for the condition assessment of the removed high-voltage battery are shown to the user on the ⇒ Vehicle diagnostic tester.*
- *Perform all steps as described in the ⇒ Vehicle diagnostic tester.*

– Open ODIS.
– Continue with “start diagnostic”.

Note

The system automatically searches for the corresponding VIN, but due to the battery diagnosis with the high-voltage battery removed cannot find the VIN.

– Error message with prompt, manually identify the vehicle using OK.
– In the window for manual entry of the vehicle base information select manual.
– Entry of VIN from the vehicle.
– Remove the check on the working with Guided Fault Finding.
– Confirm the message for confirming the deselection of the “Guided Fault Finding with yes.
– On control module list entry select “8C hybrid battery management”.

Start the options with a right click.

– Selection of Guided Functions.
– Make the communication connection by selecting identify control module.

Note

If the control module cannot be found, identify manually.

– Start the options with a right click again on “8C Hybrid Battery Management”.

– Selection of `high-voltage battery condition assessment`

– Confirm with `run`.

Follow the additional instructions and questions of the condition assessment of the high-voltage battery to the end.

– Select `protocol`.

– Select `save`.

– Select `long protocol` in the dialog window.

Note

The long protocol includes the read out measured values.

– Confirm with `OK`.

– Store the log as an HTML file including the necessary files.

6.2 High-Voltage Batteries, Handling and Storing

High-voltage batteries are classified as hazardous materials. The transport and storage are subject to certain restrictions which may vary by country. Different packaging is necessary according to the high-voltage battery classification.

Temporarily store high-voltage batteries

- The location for temporary storage of high-voltage batteries must be protected and outside of direct work areas.
- Protect the high-voltage battery from mechanical and thermal impacts as well as from moisture.
- The temporary storage location must only be accessible for authorized personnel.

Replacing high-voltage batteries

– High-Voltage Battery Classification. Refer to ⇒ “6.1.2 High-Voltage Battery Classification Using ODIS”, page 26 .

If no measures are necessary for the high-voltage battery:

- The high-voltage battery can be stored in its original packaging.

– Send back the removed high-voltage battery in the original packaging of the replacement part.

Suitable equipment must be used for the transport, due to the heavy weight of the components.

If measures are necessary for the high-voltage battery:

– DISS notification or make technical repair order.

The product support will determine further procedures.

– Leave the high-voltage battery in the vehicle.

– Move the vehicle to a secure location, following the quarantine concepts. Refer to ⇒ “4 Quarantine Concept”, page 15 .

6.3 High-Voltage Battery, Packaging

⇒ “6.3.1 High-Voltage Batteries, General Information for Packaging”, page 30

⇒ “6.3.2 High-Voltage Batteries, Packing into Original Part Packaging Box, e-up!”, page 31

⇒ “6.3.3 High-Voltage Batteries, Packing into Original Part Packaging Box, e- Golf”, page 38

6.3.1 High-Voltage Batteries, General Information for Packaging

The procedure described here, is based on the ADR law (Accord européen relatif au transport international des marchandises dangereuses par route / European Agreement concerning the International Carriage of Dangerous Goods by Road.). Country-specific laws apply. The high-voltage batteries listed are part of the category UN 3480 according to the ADR law. The most current packaging requirements and special provisions are to be found in the table of dangerous goods of the ADR.

The procedure is depending on the classification status of the high-voltage battery.

For transporting high-voltage batteries with “Warning” status, the current valid transport determination also applies.

High-voltage battery with “DANGER” status may not be transported.

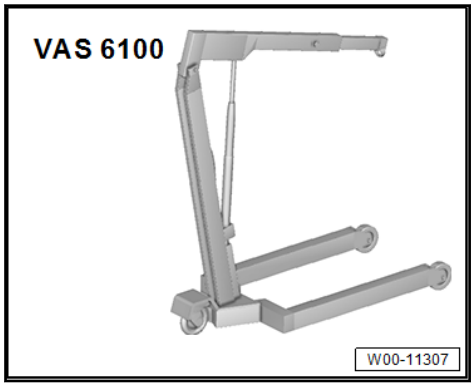
Initial situation	Performing the classification	Classification status	Allocation of packaging requirements
Batteries new/in use or old but still functioning, for example warranty claim due to low remaining battery charge capacity.	High-voltage technician or high-voltage expert	◆ Technically OK ◆ Status “NORMAL”	P 903 / LP 903 Transport in original part packaging box (protect battery from short circuit and secure battery from moving). If the battery is supposed to be disposed of or recycled, then the SV 377: P909 applies => for example original part box with notation about the item included in the package: LITHIUM-BATTERIES FOR DISPOSAL OR LITHIUM-BATTERIES FOR RECYCLING

Initial situation	Performing the classification	Classification status	Allocation of packaging requirements
Batteries damaged/ faulty, but secure to transport, for example with a faulty cell controller, a blown pyro-fuse without further damage.	High-Voltage Expert	♦ Technically not OK ♦ Status “NORMAL”	SV 376 applies: P 908 / LP 904 carton according to packaging group ‘inner packaging’ (individually in inner packaging) and ‘external packaging’ necessary (greater than 30 kg (66.14 lbs) = only one battery per ‘external packaging’) foil around battery / leaking electrolyte must be prevented, ventilation units/systems may be needed, for example ‘inner packaging’ (including non-flammable, non-conductive heat insulator). Protect the battery from short circuit. Notation on package: DAMAGED/FAULTY LITHIUM-ION BATTERY or DAMAGED/FAULTY LITHIUM-METAL BATTERY notation on the transportation paperwork: TRANSPORT ACCORDING TO SPECIAL PROVISION 376
Batteries that have a major damage and are difficult to transport SV 376 (for example leaking electrolyte or major cell defects).	High-voltage expert, if necessary, contact the importer	♦ Technically not OK ♦ Status “WARNING”	P 911 / LP 906 Special transportation packaging necessary (see overview). Packaging is approved by the responsible authorities. The respective transportation specifications apply. Packaging following the packaging group I - notation on package: DAMAGED/FAULTY LITHIUM-ION BATTERY or DAMAGED/FAULTY LITHIUM-METAL BATTERY notation on the transportation paperwork: TRANSPORT ACCORDING TO SPECIAL PROVISION 376
Battery reacts (heat development / fire / smoke, noise , etc.).	Distance - call the fire department if necessary	♦ Technically not OK ♦ Status “DANGER”	No shipping

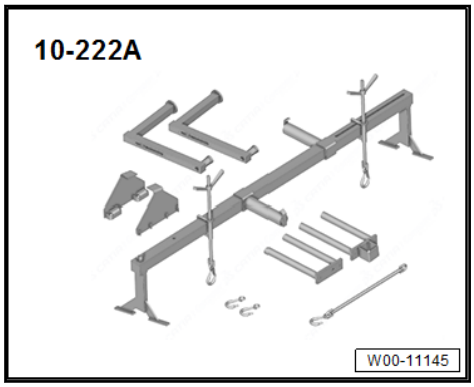
6.3.2 High-Voltage Batteries, Packing into Original Part Packaging Box, e-up!

Special tools and workshop equipment required

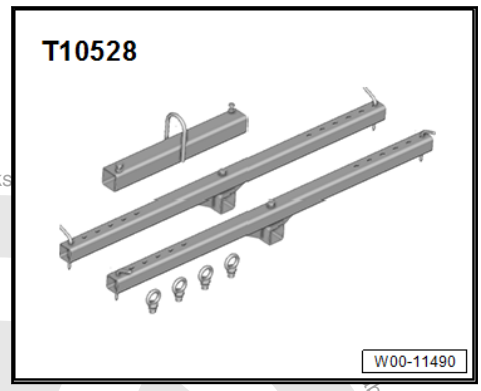
- Shop Crane - VAS 6100-



- Engine Support Bridge - 10 - 222 A-



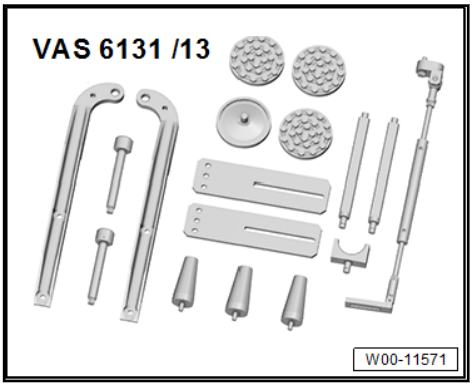
- Suspension Device - T10528-



- Scissor Lift Table - VAS 6131 B-

- Scissor Lift Table - Audi Set - Plate - VAS 6131/10-1-

- Scissor Lift Table - Q7 Set - VAS 6131/13-



Procedure Overview

The process when packaging a lithium-ion high-voltage battery for the e-up! is divided into the following steps:

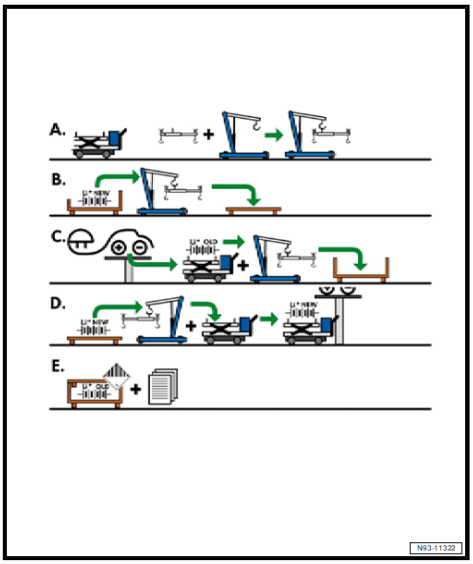
A - Prepare the scissor lift table and mount tool

B - Place the new high-voltage battery on the cover of the OT-Box

C - Remove the high-voltage battery and place in the OT-Box

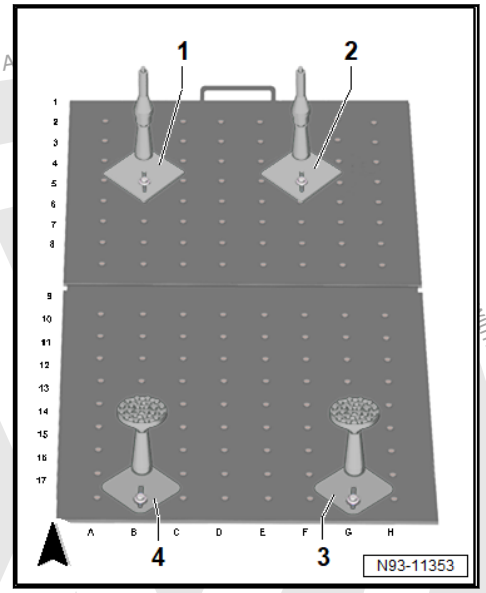
D - Position and install the new high-voltage battery from the cover of the OT-Box and on the scissor lift table

E - Seal the OT-Box and prepare it for transportation



Scissor Lift Table Preparing

– Install the mounts -1 and 4- on the Scissor Lift Table - VAS 6131 B- and align it.



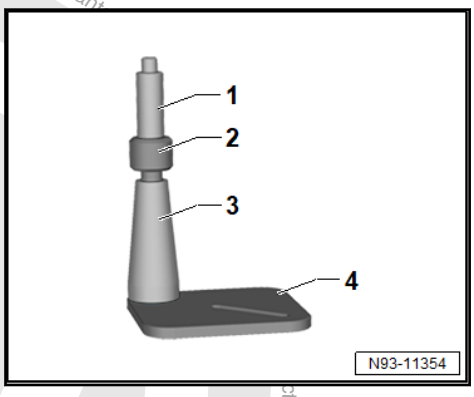
Front mounts -1 and 2-:

1 - Scissor Lift Table - Audi Set - Adapters - VAS 6131/10-11-

2 - Scissor Lift Table - Audi Set - Spindles - VAS 6131/10-5-

3 - Scissor Lift Table - Audi Set - Support Tapers - VAS 6131/10-4-

4 - Scissor Lift Table - Audi Set - Plate - VAS 6131/10-1-



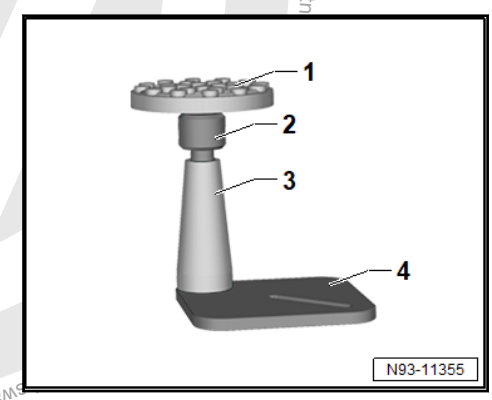
Rear mounts -3 and 4-:

1 - Scissor Lift Table - Q7 Set - Universal Supports - VAS 6131/13-2-

2 - Scissor Lift Table - Audi Set - Spindles - VAS 6131/10-5-

3 - Scissor Lift Table - Audi Set - Support Tapers - VAS 6131/10-4-

4 - Scissor Lift Table - Q7 Set - Plate - VAS 6131/13-4-



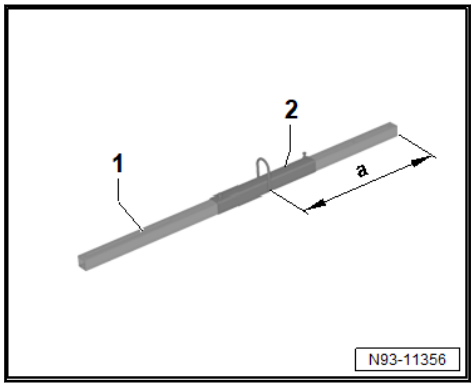
Mount, preparing

– Push the Suspension Device - Mount - T10528/1- -2- on the Engine Support Bridge - 10 - 222 A- -1-.

– Adjust and secure the Suspension Device - Mount - T10528/1- -2- on -dimension a-.

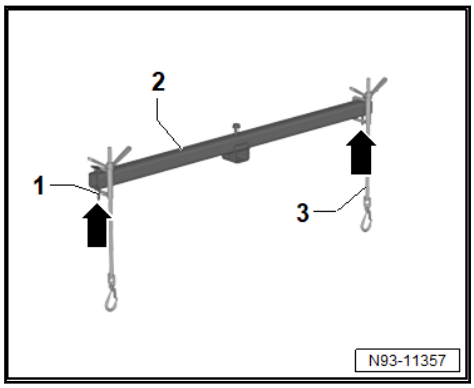
• -Dimension a-: 515 mm

– Engage the Engine Support Bridge - 10 - 222 A- -1- with the Suspension Device - Mount - T10528/1- -2- on the Shop Crane - AS 6100- .

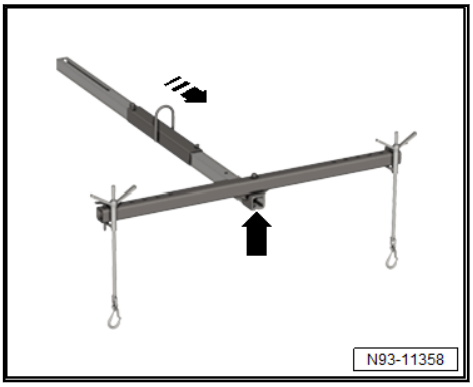


– Push the two Scissor Lift Table - Audi Set - 10 - 222 A /10- -3- as shown on the first Suspension Device - Cross Bar - T10528/2- -2-.

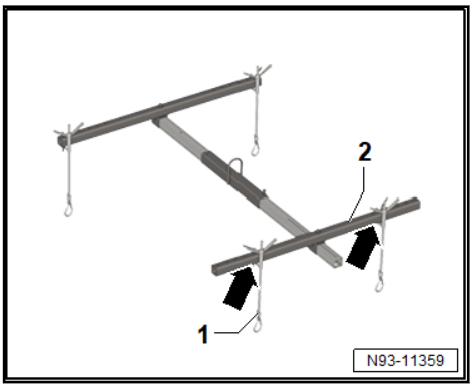
– Insert the Suspension Device - Securing Hole - T10528/3- outward in position 6 -arrows-.



– Push the prepared Suspension Device - Cross Bar - T10528/2- in the -direction of the arrow- on the Engine Support Bridge - 10 - 222 A- .
– The Suspension Device - Cross Bar - T10528/2- must be flush -arrow-.
– Secure the Suspension Device - Cross Bar - T10528/2- .

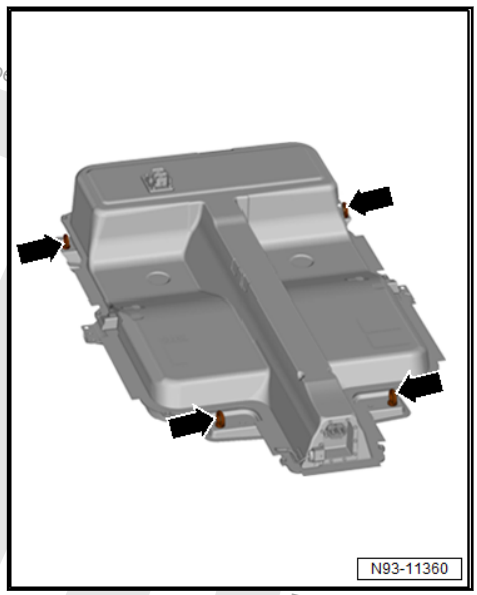


– Push the two Scissor Lift Table - Audi Set - 10 - 222 A /10- -1- as shown on the second Suspension Device - Cross Bar - T10528/2- -2-.
– Insert the inner Suspension Device - Securing Hole - T10528/3- in position 2 -arrows-.
– Push the second prepared Suspension Device - Cross Bar - T10528/2- on the Engine Support Bridge - 10 - 222 A-
– Leave the securing of the Suspension Device - Cross Bar - T10528/2- loose.



Place the new High-Voltage Battery 1 - AX2- on the cover of the OT-Box

– Open the OT-Box.
– Remove the cover and place it with the top facing upward on the surface, so that the cover can reach the Scissor Lift Table - VAS 6131 B- and the workshop crane.
– If the bolts -arrows- are secured with those in the High-Voltage Battery 1 - AX2- in the OT-Box, loosen them.
– Remove the nuts and washers.
– Secure the Suspension Device - Lifting Eyebolt - T10528/5- at the marked positions -arrows- on the High-Voltage Battery 1 - AX2- .
– Drive the Shop Crane - VAS 6100- with the prepared Suspension Device - T10528- over the High-Voltage Battery 1 - AX2- .



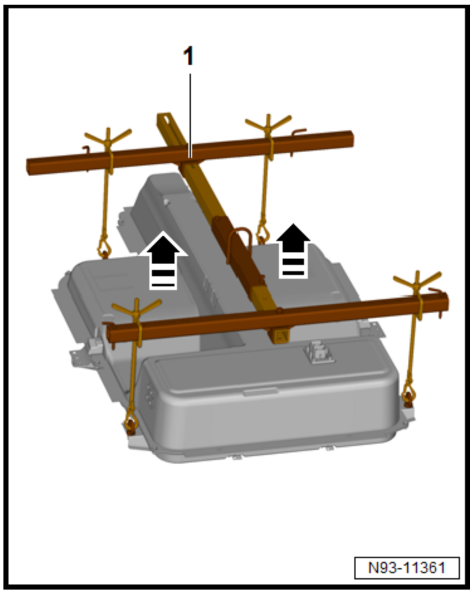
NOTICE

Damage to the High-Voltage Battery 1 - AX2- possible.

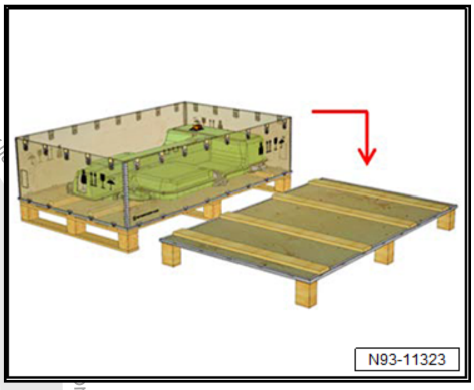
– Do not place the Suspension Device - T10528- on the High-Voltage Battery 1 - AX2- .

– Engage the Engine Support - Bracket w/Spindle and Hook - 10 - 222 A /10- in the Suspension Device - Lifting Eyebolt - T10528/5- -arrows-.
– Align the second still loose Suspension Device - Cross Bar - T10528/2- straight and secure it.

– Pry out the High-Voltage Battery 1 - AX2- in the -direction of the arrow- with the Suspension Device - T10528- -1-.



– Place the High-Voltage Battery 1 - AX2- on the top of the cover of the OT-Box.



NOTICE

Damage to the High-Voltage Battery 1 - AX2- possible.

– **Do not place the Suspension Device - T10528- on the High-Voltage Battery 1 - AX2- .**

– Loosen the Engine Support - Bracket w/Spindle and hook - 10-222 A/10- .

– Remove the Suspension Device - Lifting Eyebolt - T10528/5- .

Remove the High-Voltage Battery 1 - AX2- and place in the OT-Box

– Perform a condition assessment of the old High-Voltage Battery 1 - AX2- when installed. Refer to ⇒ “6.1.2 High-Voltage Battery Classification Using ODIS”, page 26 .

– Remove the High-Voltage Battery 1 - AX2- . Refer to ⇒ Rep. Gr. 93 ; High-Voltage Battery Unit; High-Voltage Battery 1 AX2, Removing and Installing. .

– Perform a visual inspection of the High-Voltage Battery 1 - AX2- , to ensure the transportability.

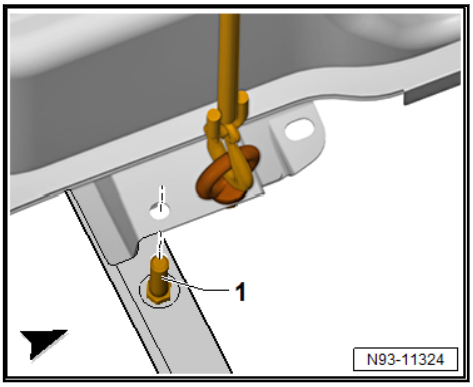
– Remove the High-Voltage Battery 1 - AX2- from the Scissor Lift Table - VAS 6131 B- .

– Lower the High-Voltage Battery 1 - AX2- in to the OT-Box.

Note

Pay attention to the bolts -1-!

– Guide the old bolts -1- through the respective holes.
– Loosen the Engine Support - Bracket w/Spindle and hook - 10-222 A/10- .
– Remove the Suspension Device - Lifting Eyebolt - T10528/5- .



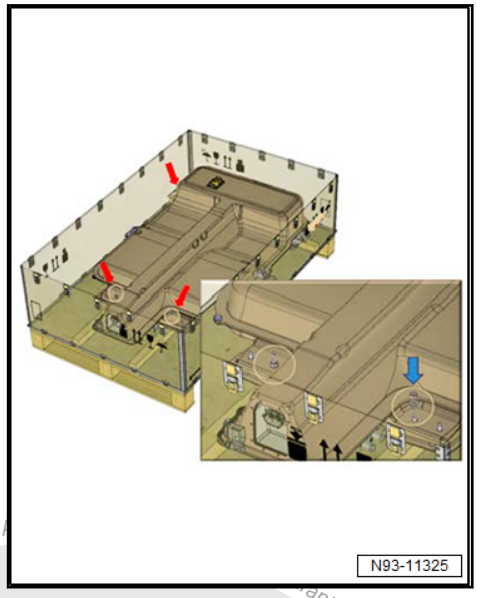
Note

- *If a bolt turns, counter turning the bolt is necessary.*
- *When tightening the bolts pay attention that the battery lower cover is not distorted.*

– Bolt and secure the nuts with the washer on the four bolts in the OT-Box.

Position and install the new High-Voltage Battery 1 - AX2- from the cover of the OT-Box on the Scissor Lift Table - VAS 6131 B-

– Remove the High-Voltage Battery 1 - AX2- from the cover of the OT-Box.
– Secure the High-Voltage Battery 1 - AX2- on the Scissor Lift Table - VAS 6131 B- .
– Install the High-Voltage Battery 1 - AX2- . Refer to ⇒ Rep. Gr. 93 ; High-Voltage Battery Unit; High-Voltage Battery 1 AX2, Removing and Installing. .



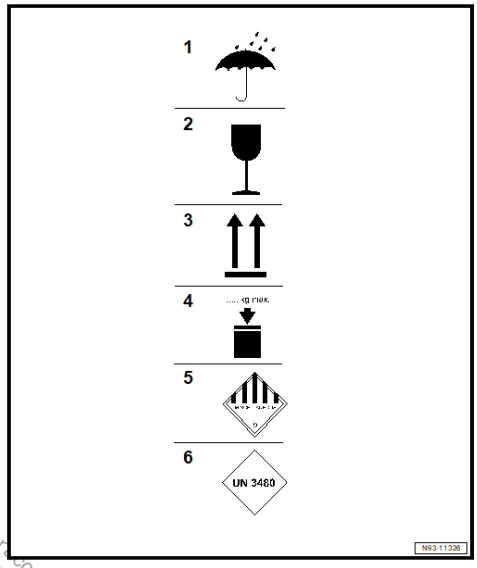
Seal the OT-Box and prepare it for transportation

Note

If the side panels should be dismounted, when assembling the lower tab of the side panel must be bent back.

– Position the cover of the OT-Box and seal with the clips present.
– Apply the tensioning strap.
– Apply or check the hazardous materials and packaging labeling.
– Fill out and include the transportation documents.

Information about transportation preparation and hazardous material identification (Europe)



1 - “Protect from moisture”

2 - “Caution fragile”

3 - “This side up”

4 - “Stacking load limit”

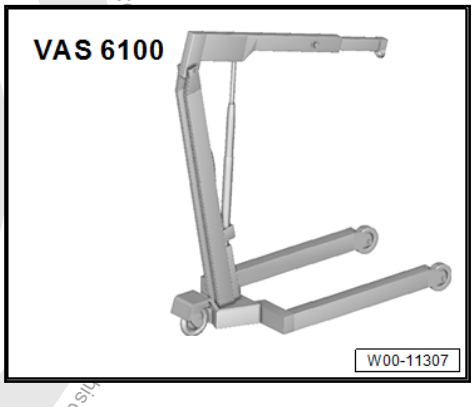
5 - “Hazardous materials label: hazardous materials class 9 “Different dangerous materials and objects””

6 - “Type label with UM-number UN 3480 for lithium-ion batteries”

6.3.3 High-Voltage Batteries, Packing into Original Part Packaging Box, e- Golf

Special tools and workshop equipment required

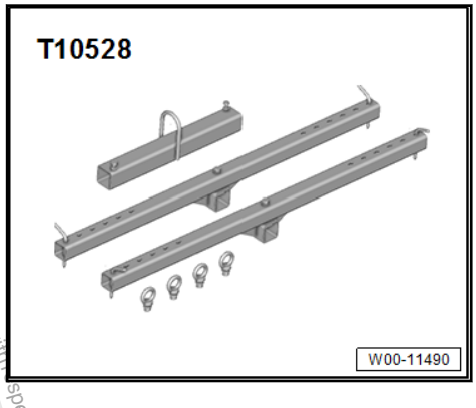
- Shop Crane - VAS 6100-



- Engine Support Bridge - 10 - 222 A-

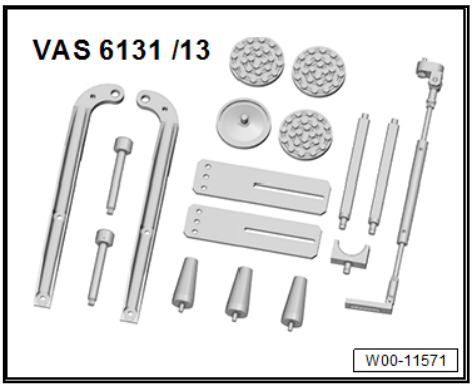
- Engine Support - Bracket w/Spindle and Hook - 10-222A/10- (quantity: 6)
- Engine/Gearbox Support Shackle (2 pc.) - 10-222A/12- (quantity: 2)

- Suspension Device - T10528-



- Suspension Device - Securing Hole - T10528/3-
- Suspension Device - Lifting Eyebolt - T10528/5-
- Suspension Device - Supplement for Bracket - T10528/7-/10-
- Scissor Lift Table - VAS 6131 B-

- Scissor Lift Table - Audi Set - Plate - VAS 6131/10-1-
- Scissor Lift Table - Q7 Set - VAS 6131/13-



Procedure Overview

The process when packaging a lithium-ion high-voltage battery for the e-up! is divided into the following steps:

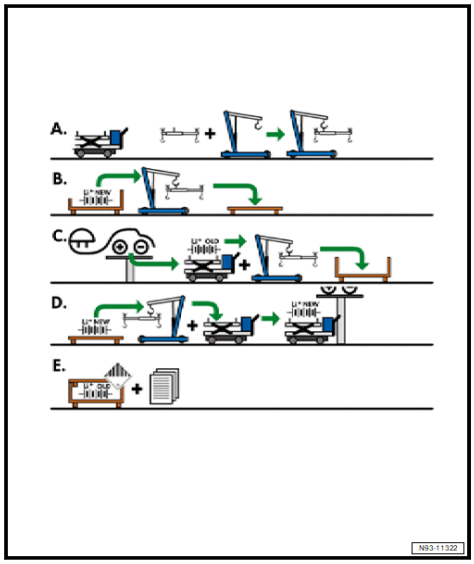
A - Prepare the scissor lift table and mount tool

B - Place the new high-voltage battery on the cover of the OT-Box

C - Remove the high-voltage battery and place in the OT-Box

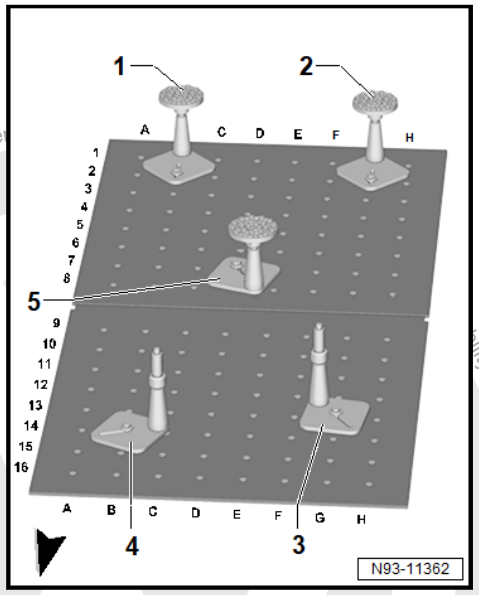
D - Position and install the new high-voltage battery from the cover of the OT-Box and on the scissor lift table

E - Seal the OT-Box and prepare it for transportation



Scissor Lift Table Preparing

– Install the mounts -1 and 5- on the Scissor Lift Table - VAS 6131 B- and align it.



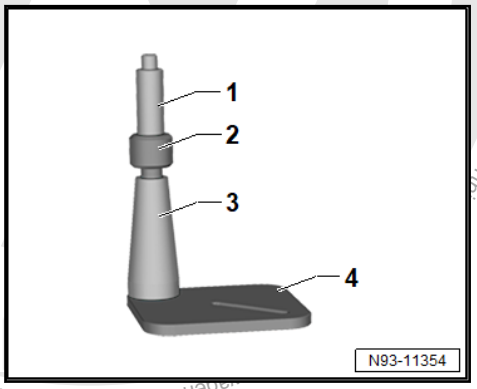
Front Mounts -3- and -4- for High-Voltage Battery 1 - AX2-

1 - Scissor Lift Table - Audi Set - Adapters - VAS 6131/10-11-

2 - Scissor Lift Table - Audi Set - Spindles - VAS 6131/10-5-

3 - Scissor Lift Table - Audi Set - Support Tapers - VAS 6131/10-4-

4 - Scissor Lift Table - Audi Set - Plate - VAS 6131/10-1-



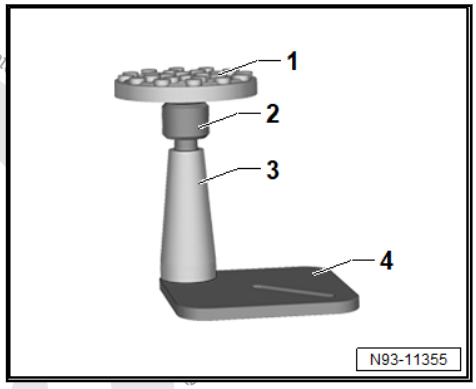
Rear Mounts -1-, -2- and -5- for High-Voltage Battery 1 - AX2-

1 - Scissor Lift Table - Q7 Set - Universal Supports - VAS 6131/13-2-

2 - Scissor Lift Table - Audi Set - Spindles - VAS 6131/10-5-

3 - Scissor Lift Table - Audi Set - Support Tapers - VAS 6131/10-4-

4 - Scissor Lift Table - Audi Set - Plate - VAS 6131/10-1-



Mount, preparing

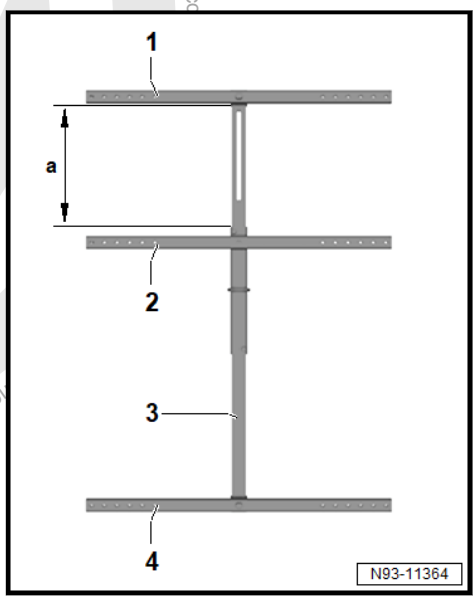
– Push the Suspension Device - Mount - T10528/10- -2- on the Engine Support Bridge - 10 - 222 A- -3-.

– Push on the Suspension Device - Cross Bar - T10528/2- -1- on both ends and tighten.

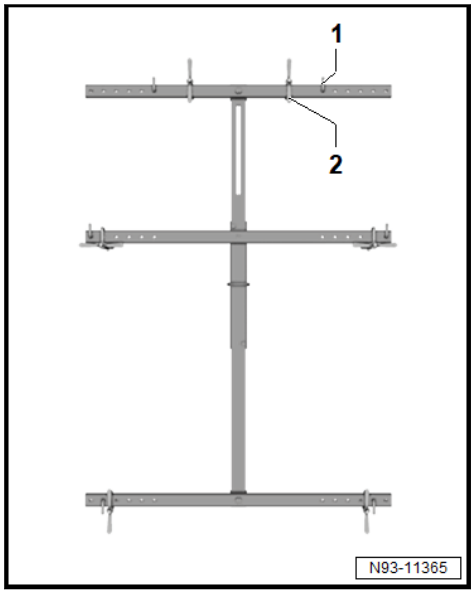
– Adjust the Suspension Device - Mount - T10528/10- -2- as shown to the dimension specified and tighten.

• -Dimension a-: 515 mm

– Engage the Engine Support Bridge - 10 - 222 A- with the Mount - T10528/10- on the Shop Crane - VAS 6100- .



– Push the Engine Support - Bracket w/Spindle and Hook - 10 - 222 A /10- -2- as shown on the Suspension Device - Cross Bar - T10528/2- and Suspension Device - Mount - T10528/10- .



Note

Both hooks must be the same length on a cross bar.

– Position the Suspension Device - Securing Hole - T10528/3- -1- in the holes shown.

- Suspension Device - Cross Bar - T10528/2- at the oblong hole: position 1
- Suspension Device - Mount - T10528/10- in the center: position 6
- Suspension Device - Cross Bar - T10528/2- across from the oblong hole: position 5

Place the new High-Voltage Battery 1 - AX2- on the cover of the OT-Box

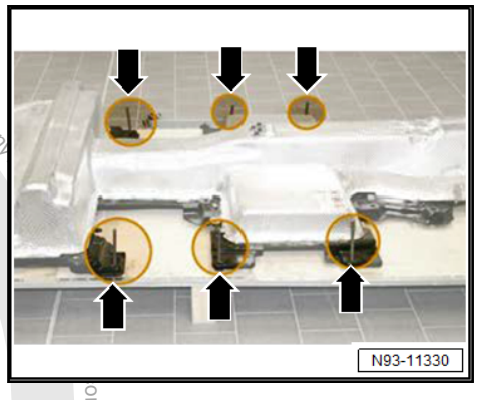
– Open the OT-Box.

– Remove the cover and place it with the top facing upward on the surface, so that the cover can reach the Scissor Lift Table - VAS 6131 B- and the workshop crane.

Note

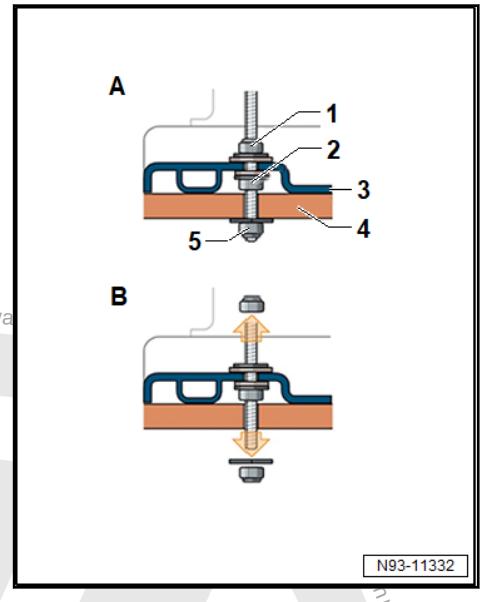
- *The new High-Voltage Battery 1 - AX2- is secured on the OT-Box at six positions with two nuts respectively.*
- *The center nut is used to lift.*

– Do not dismount the threaded rods and nuts -arrows-.

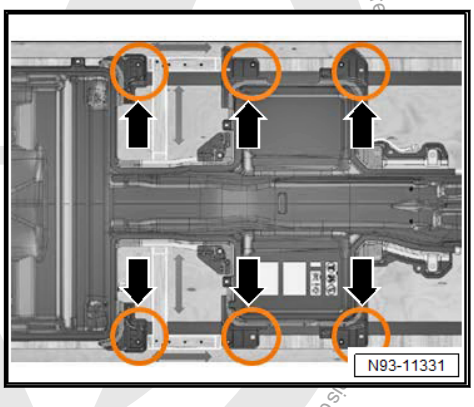


Detailed view

1 - Upper Nut (Self-Locking) on High-Voltage Battery
2 - Center Nut (used to lift)
3 - High-Voltage Battery 1 - AX2-
4 - OT-Box
5 - Lower nut (self-locking) on the OT-Box



– Remove the nuts -arrows-.

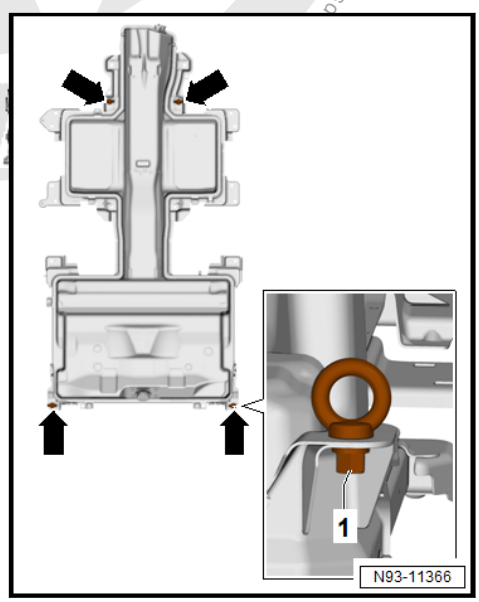


Secure the Suspension Device - Lifting Eyebolt - T10528/5- on the High-Voltage Battery 1 - AX2-

Note

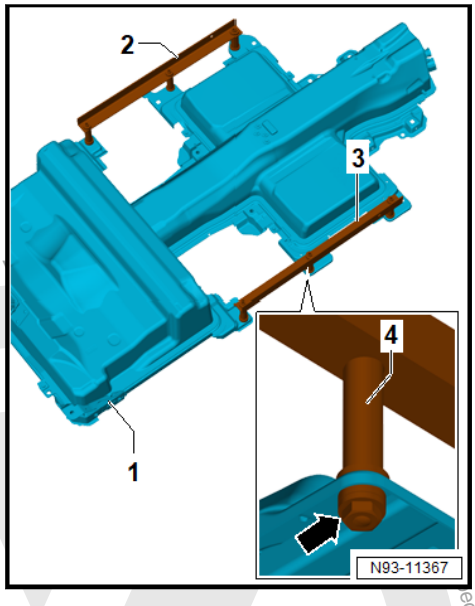
Use the washers

– Install the Suspension Device - Lifting Eyebolt - T10528/5- at the positions -arrows- shown.
– Tighten the Suspension Device - Lifting Eyebolt - T10528/5- -1-.



Reinforcement Braces, Installing

- Install the reinforcement braces on the High-Voltage Battery 1 - AX2- -1- as shown. To do so, continue as follows:
- Secure the Suspension Device - Supplement for Bracket - T10528/7/8- -2- and -3- on the threaded rods.
- Lightly tighten the Suspension Device - Sleeve with Internal Threads - T10528/9- -4-.
- Install the nuts flush -arrow- on the threaded rods. Otherwise the cover of the OT-Box will be damaged.
- Engage and secure the Engine/Gearbox Support Shackle - 10-222A/12- in the reinforcement brace hole.



Detailed view

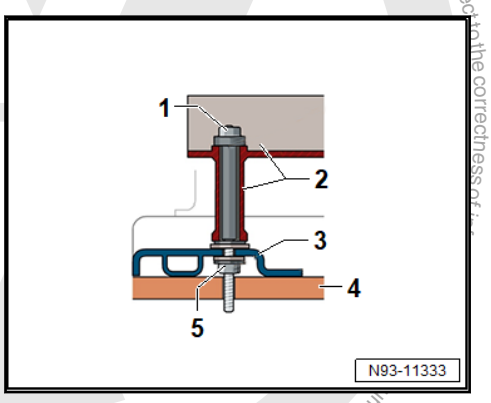
1 - Suspension Device - Sleeve with Internal Threads - T10528/9-

2 - Suspension Device - Supplement for Bracket - T10528/7/8-

3 - High-Voltage Battery 1 - AX2-

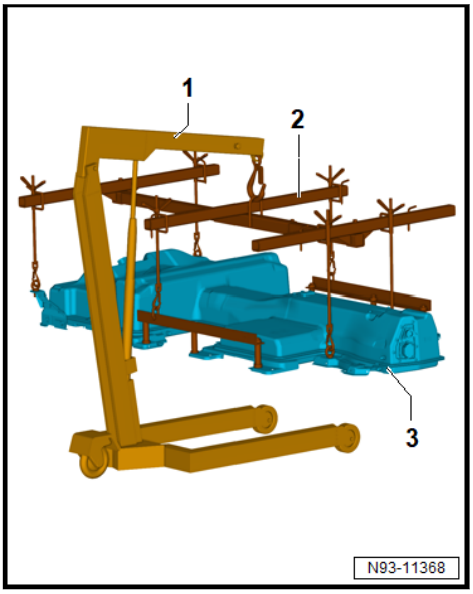
4 - OT-Box

5 - Center Nut



Secure the cross bar on the High-Voltage Battery 1 - AX2- .

– Drive the Shop Crane - VAS 6100- -1- with the prepared Suspension Device - T10528- -2- over the High-Voltage Battery 1 - AX2- -3-.



NOTICE

Damage to the High-Voltage Battery 1 - AX2- possible.

– Do not place the Suspension Device - T10528- on the High-Voltage Battery 1 - AX2- .

– Engage the Engine Support - Bracket w/Spindle and Hook - 10 - 222 A /10- in the Suspension Device - Lifting Eyebolt - T10528/5- .

– Align the Engine Support - Bracket w/Spindle and Hook - 10 - 222 A /10- on the front and rear Suspension Device - Cross Bar - T10528/2- straight and secure.

– Engage the Engine Support - Bracket w/Spindle and Hook - 10 - 222 A /10- in the Suspension Device - Mount - T10528/10- .

– Lightly tension the Engine Support - Bracket w/Spindle and Hook - 10 - 222 A /10- in the Suspension Device - Mount - T10528/10- .

– Lift the High-Voltage Battery 1 - AX2- using the Shop Crane - VAS 6100- .

– Place the High-Voltage Battery 1 - AX2- with the Shop Crane - VAS 6100- on the cover of the OT-Box.

– Dismount the Suspension Device - Lifting Eyebolt - T10528/5- and Suspension Device - Supplement for Bracket - T10528/7/8- .

Remove the High-Voltage Battery 1 - AX2- and place in the OT-Box

– Perform a condition assessment of the old High-Voltage Battery 1 - AX2- when installed. Refer to ⇒ “6.1.2 High-Voltage Battery Classification Using ODIS”, page 26 .

– Remove the High-Voltage Battery 1 - AX2- . Refer to ⇒ Rep. Gr. 93 ; High-Voltage Battery Unit; High-Voltage Battery 1 AX2, Removing and Installing. .

– Perform a visual inspection of the High-Voltage Battery 1 - AX2- , to ensure the transportability.

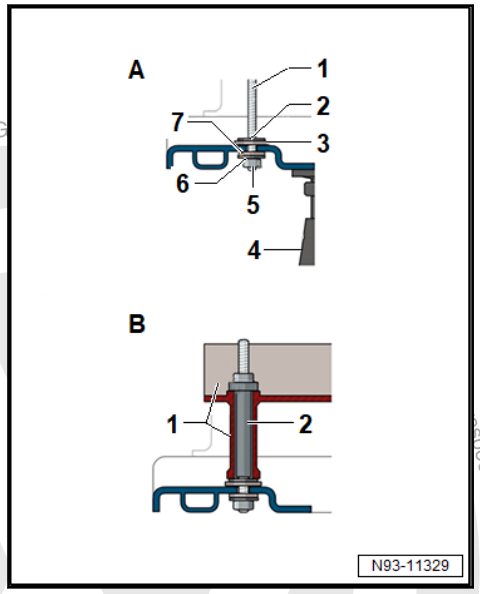
In the next step, the Suspension Device - Reinforcement Brace - T10528/7- and Suspension Device - Reinforcement Brace - T10528/8- are installed on the High-Voltage Battery 1 - AX2- .

The necessary components are included in the new High-Voltage Battery 1 - AX2- set.

The set consists of:

- Six threaded rods
- Six washers
- Six nuts

Detailed view



A

1 - Threaded Rod

2 - Metal Washer

3 - Large Plastic Washer

4 - Scissor Lift Table Attachment

5 - Nut

6 - Metal Washer

7 - Small Plastic Washer

B

1 - Suspension Device - Supplement for Bracket - T10528/7/8-

2 - Suspension Device - Sleeve with Internal Threads - T10528/9-

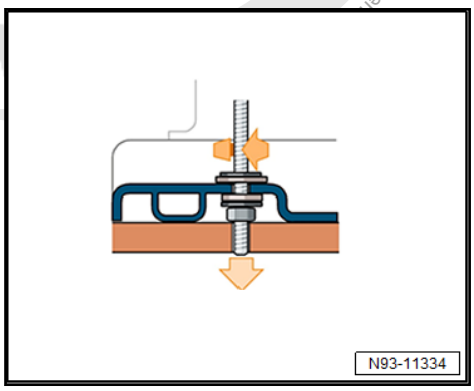
Install the Suspension Device - Lifting Eyebolt - T10528/5- as described above.

– Lift the High-Voltage Battery 1 - AX2- as described above.

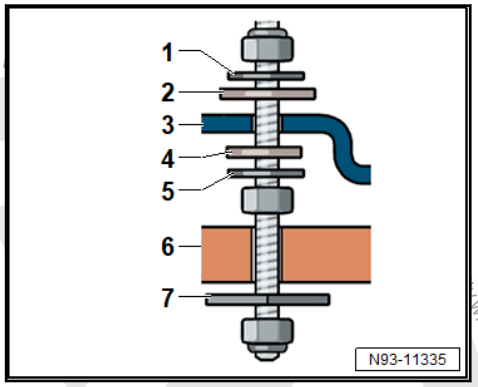
– Lower the High-Voltage Battery 1 - AX2- in to the OT-Box.

– Dismount the Suspension Device - Lifting Eyebolt - T10528/5- and Suspension Device - Supplement for Bracket - T10528/7/8- .

– Install the threaded rods as far as possible, so that it protrudes downward out of the floor of the OT-Box.



– Pay attention to the correct sequence of the washers!



1 - Small Metal Washer
2 - Large Plastic Washer
3 - High-Voltage Battery 1 - AX2-
4 - Small Plastic Washer
5 - Small Metal Washer
6 - OT-Box
7 - Square, Large Metal Washer

Note

When tightening the nuts pay attention that the battery lower cover is not distorted.

– Secure the High-Voltage Battery 1 - AX2- in the OT-Box from above and below using the self-locking nut.

Position and install the new High-Voltage Battery 1 - AX2- from the cover of the OT-Box on the Scissor Lift Table - VAS 6131 B-

– Remove the High-Voltage Battery 1 - AX2- from the cover of the OT-Box.
– Secure the High-Voltage Battery 1 - AX2- on the Scissor Lift Table - VAS 6131 B- .
– Install the High-Voltage Battery 1 - AX2- . Refer to ⇒ Rep. Gr. 93 ; High-Voltage Battery Unit; High-Voltage Battery 1 AX2, Removing and Installing. .

Seal the OT-Box and prepare it for transportation

Note

If the side panels should be dismounted, when assembling the lower tab of the side panel must be bent back.

– Position the cover of the OT-Box and seal with the clips present.
– Apply the tensioning strap.
– Apply or check the hazardous materials and packaging labeling.
– Fill out and include the transportation documents.

Information about transportation preparation and hazardous material identification (Europe)

1 - “Protect from moisture”

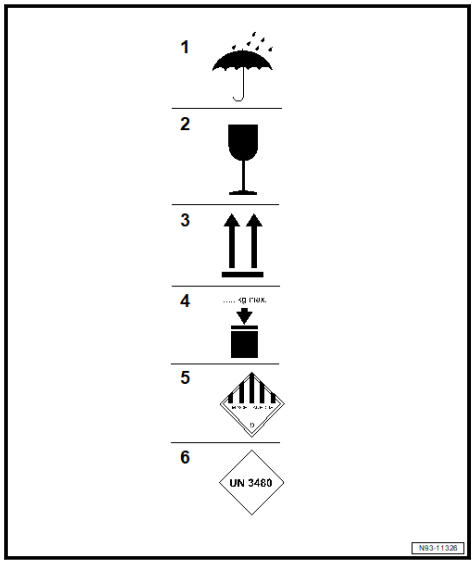
2 - “Caution fragile”

3 - “This side up”

4 - “Stacking load limit”

5 - “Hazardous materials label: hazardous materials class 9 “Different dangerous materials and objects””

6 - “Type label with UM-number UN 3480 for lithium-ion batteries”



6.4 Critical High Voltage Battery, Packaging with “Warning” Status

⇒ “6.4.1 Overview, Packaging”, page 48

⇒ “6.4.2 Critical High Voltage Battery, Packaging with Warning Status, Module”, page 50

⇒ “6.4.3 Critical High Voltage Battery, Packaging with Warning Status, Golf GTE, Passat GTE, T7 Multivan, Tiguan, Arteon”, page 53

⇒ “6.4.4 Packaging of Critical High-Voltage Batteries with Warning Status, e-Golf, e-Crafter, e-Up!”, page 59

6.4.1 Overview, Packaging

Pay attention to the general information about packaging high-voltage batteries. Refer to ⇒ “6.3.1 High-Voltage Batteries, General Information for Packaging”, page 30 .

			Container type							
			Single wall					Double wall		
			S-Box X2	M-Box X2		XXL-Box		L-Box		LP-Box
Brand	**Battery type from vehicle model**	**Cell type**	**Maximum one module**	**Maximum two modules**	**One system**	**Maximum eight modules**	**One system**	**Maximum eight modules**	**One system**	**One system / module**
VW	e-Up!	25 Ah prism. Sanyo	x	x	-	x	x	x. Refer to [1].	-	x. Refer to [1].
VW	e-Golf; e-Golf GP	25 Ah prism. Sanyo; 37Ah prism. SDI	x	x	-	x	x	x. Refer to [1].	-	x. Refer to [1].

			Container type							
			Single wall					Double wall		
			S-Box X2	M-Box X2		XXL-Box		L-Box		LP-Box
Brand	**Battery type from vehicle model**	**Cell type**	**Maximum one module**	**Maximum two modules**	**One system**	**Maximum eight modules**	**One system**	**Maximum eight modules**	**One system**	**One system / module**
VW	Golf GTE	25 Ah prism. Sanyo	-	x (one module)	x	x	x (two systems)	x. Refer to 1).	x. Refer to 1).	x. Refer to 1).
VW	Passat GTE	28 Ah prism. SDI	-	x (one module)	x	x	x (two systems)	x. Refer to 1).	x. Refer to 1).	x. Refer to 1).
VW	XL1	25 Ah prism. Sanyo	x	x	-	x	x	x. Refer to 1).	x. Refer to 1).	x. Refer to 1).
VW	Jetta Hybrid	5 Ah prism. Sanyo	-	-	-	-	x (two systems)	-	x. Refer to 1).	x. Refer to 1).
VW	e-Up! 2020	60 Ah Pouch LG	-	-	-	-	-	x	-	x
VW	Passat GTE 2019	37 Ah prism. SDI	x	x	x	x	x	x. Refer to 1).	x. Refer to 1).	x. Refer to 1).
VW	Touareg	48 Ah prism. SDI	-	-	-	-	-	x (seven modules)	x	x. Refer to 1).
VW	Golf 2020 mHEV	13.8 Ah prism. CATL	x (one system)	-	x (two systems)	-	x (eight systems)	-	X. Refer to 1) (eight systems)	x. Refer to 1).
VW	Eco Freewheel Golf7	6.9 Ah prism. CATL	x (one system)	-	x (two systems)	-	x (eight systems)	-	X. Refer to 1) (eight systems)	x. Refer to 1).
VW	12 V FMA additional memory	4.48 Ah LiFePO4 CATL	x (one system)	-	x (two systems)	-	x (eight systems)	-	X. Refer to 1) (eight systems)	x. Refer to 1).

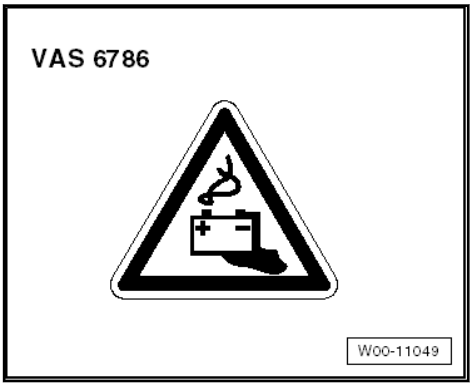
			Container type							
			Single wall					Double wall		
			S-Box X2	M-Box X2		XXL-Box		L-Box		LP-Box
Brand	**Battery type from vehicle model**	**Cell type**	**Maximum one module**	**Maximum two modules**	**One system**	**Maximum eight modules**	**One system**	**Maximum eight modules**	**One system**	**One system / module**
VW	48 V vehicle electrical system	9.5 Ah-Pouch LG	x (one system)	-	x (two systems)	-	x (eight systems)	-	X. Refer to [1] (eight systems)	x. Refer to [1].
VW	Battery	Maximum 70 Ah LiFePO4	x (one system)	-	x (two systems)	-	x (eight systems)	-	X. Refer to [1] (eight systems)	x. Refer to [1].
VWN	e-Crafter	37 Ah prism. SDI	x	x	-	x	x		-	x. Refer to [1].
VWN	T7 battery	40 Ah Pouch A123 LiFePO4	x (one system)	-	x (two systems)	-	x (eight systems)	-	X. Refer to [1] (eight systems)	x. Refer to [1].
VWN	T7	28 Ah prism. SDI	-	x (one module)	x	x	x (two systems)	x. Refer to [1].	x. Refer to [1].	x. Refer to [1].
MAN	JBP	28 Ah prism. SDI	x	x		x	x	x. Refer to [1].	x. Refer to [1].	x. Refer to [1].
MAN	E4C	60 Ah Pouch LG	-		-	-	-	x	-	x

1) double wall packaging possible, but not necessary regarding energy load, fire load etc. of the battery

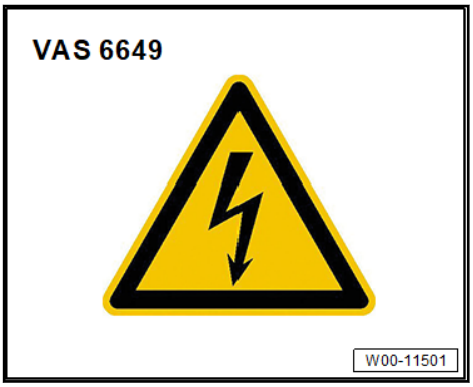
6.4.2 Critical High Voltage Battery, Packaging with “Warning” Status, Module

Special tools and workshop equipment required

- Warning Sign - Battery - VAS 6786-



- Warning Sign - High Voltage - VAS 6649-



- High-Voltage Barrier (6 pcs.) - VAS 6884-
- Personal Protective Equipment
- Dust mask

DANGER

Extremely dangerous due to high-voltage.

Electrocution can cause death or very serious personal injury.

- **Wear ESD safe clothing.**
- **Wear an insulated helmet with face protection.**
- **Wear safety gloves.**
- **Wear protective footwear.**

WARNING

Health hazard due to dust of the hollow glass granules.

Irreversible impairment of the respiratory system due to dust particles in the lung possible.

- **Wear a dust mask.**

– Refer to ⇒ “6.1 High-Voltage Battery Classification”, page 22 .

Preparing the transportation packaging

Special transportation packaging is required for evaluated high-voltage batteries with “WARNING” status. The currently valid transportation determination applies.

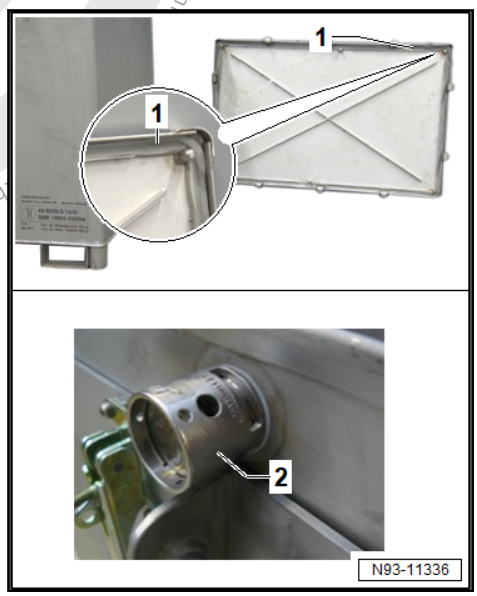
For transporting high-voltage batteries in “Warning” status, the current valid transport determination also applies.

– Find a suitable transport packaging. Refer to ⇒ “6.4.1 Overview, Packaging”, page 48 .

Packaging high-voltage module

Packaging is described for the M-box as an example.

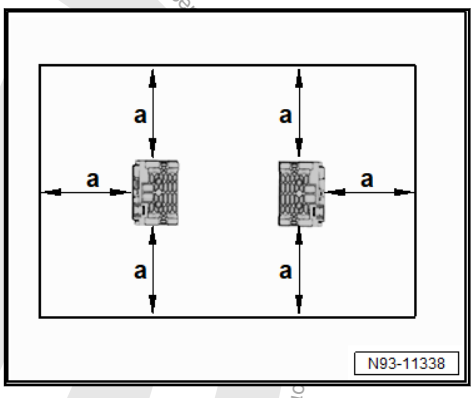
– Secure all contacts of the battery modules from the short circuit.
– Seal all opening for the operating materials except for electrolyte.
– Remove any clinging hazardous materials such as electrolyte from the outside of the battery modules.
– Wrap the module airtight with suitable packaging material, for example plastic bags or adhesive tape.
– Open the fasteners of the transport box.
– Remove the transportation packaging cover.
– Remove the bag with hollow glass granules.
– Check the seal -1- and the pressure relief valves -2- for damage.



– Fill the hollow glass granules on the floor of the transport box up to a thickness of min. 200 mm.
– Place the module in the transport box.

• If there are multiple modules, then they need to be placed upright.
• The dimension a in between the inner walls and the modules must be at least 120 mm.
• The distance between the modules must be at least 200 mm.
• The distance between the top of the module and the upper edge of the transportation box, must be at least 200 mm.

– Place the module in the transport box.
– Fill the hollow glass granules so that the open spaces as well as the entire transport box is filled to the upper edge.



Note

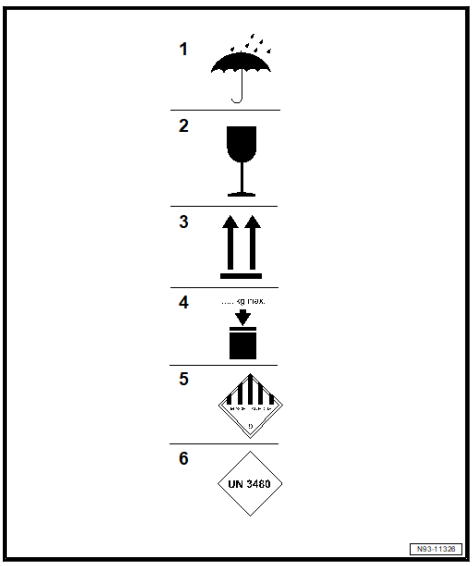
If the cover is difficult to close turn the cover 180° if necessary.

– Check the surrounding rubber seal for damage.
– Place the cover on the transportation box.
– Use the locks all around the cover to close it tightly, if necessary, re-tension the locks.
– Fill out and include the transportation documents.
– Attach the warning message for the dangerous materials and warning label on both long sides of the transport box.

♦ “Hazardous material class 9”
♦ “UN number 3480”
♦ “Attention! Lithium-ion battery damaged”
♦ “This side up”

Information about transportation preparation and hazardous material identification (Europe)

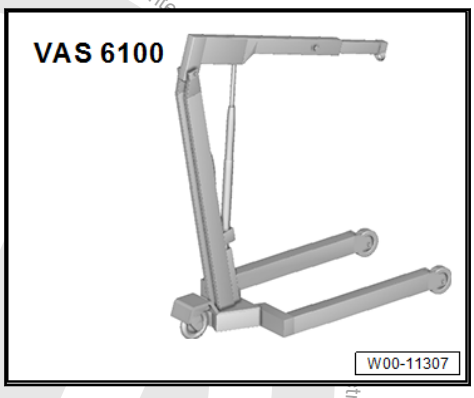
1 - “Protect from moisture”
2 - “Caution fragile”
3 - “This side up”
4 - “Stacking load limit”
5 - “Hazardous materials label: hazardous materials class 9 “Different dangerous materials and objects””
6 - “Type label with UM-number UN3480 for lithium-ion batteries”



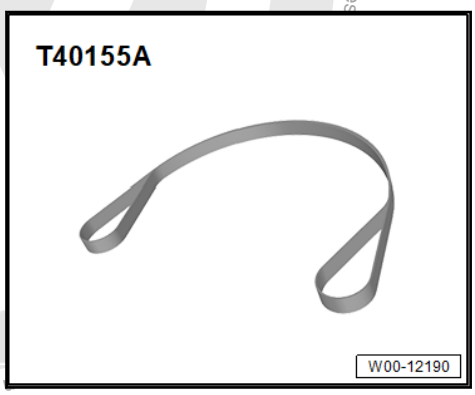
6.4.3 Critical High Voltage Battery, Packaging with “Warning” Status, Golf GTE, Passat GTE, T7 Multivan, Tiguan, Arteon

Special tools and workshop equipment required

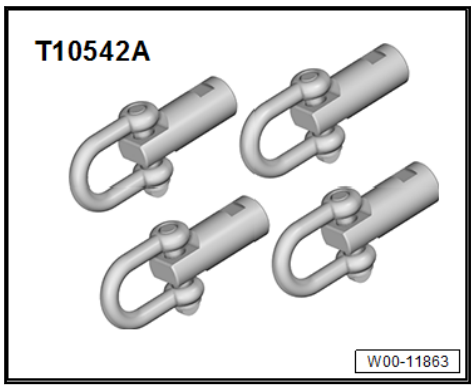
- Shop Crane - VAS 6100-



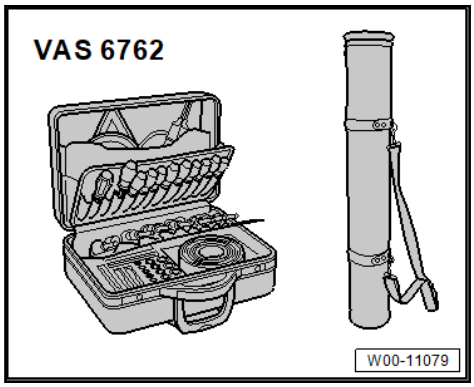
- Holding Strap - T40155A-



- Adapter - T10542A-

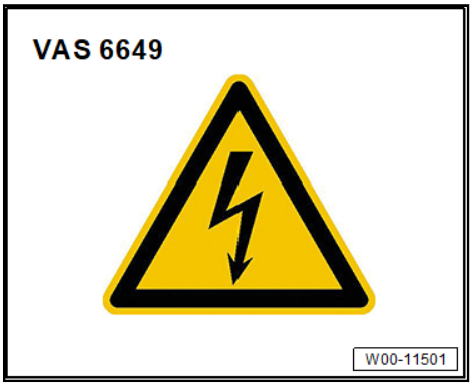


- Shackle - VAS 691 009A-
- High Voltage Tool Set - VAS 6762-



- Warning Sign - Battery - VAS 6786-

- Warning Sign - High Voltage - VAS 6649-



- High-Voltage Barrier (6 pcs.) - VAS 6884-
- Personal Protective Equipment
- Dust mask

DANGER

Extremely dangerous due to high-voltage.

Electrocution can cause death or very serious personal injury.

– Wear ESD safe clothing.
– Wear an insulated helmet with face protection.
– Wear safety gloves.
– Wear protective footwear.

WARNING

Health hazard due to dust of the hollow glass granules.

Irreversible impairment of the respiratory system due to dust particles in the lung possible.

– Wear a dust mask.

– Refer to ⇒ “6.1 High-Voltage Battery Classification”, page 22 .

Preparing the transportation packaging

Special transportation packaging is required for evaluated high-voltage batteries with “WARNING” status. The currently valid transportation determination applies.

For transporting high-voltage batteries in “Warning” status, the current valid transport determination also applies.

– Find a suitable transport packaging. Refer to ⇒ “6.4.1 Overview, Packaging”, page 48 .

High-Voltage Battery, Packaging

Packaging is described for the M-box and XXL-box as an example.

- Protect all contacts from the High-Voltage Battery 1 - AX2- against short circuit.
- Seal all opening for the operating materials except for electrolyte.
- Remove any clinging hazardous materials such as electrolyte on the High-Voltage Battery 1 - AX2- .

NOTICE

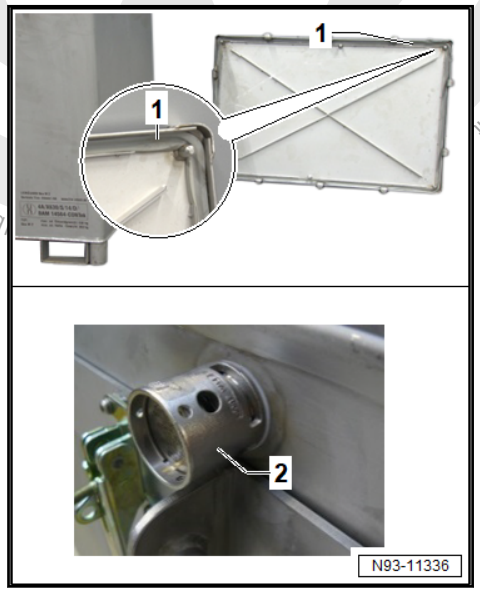
Damage to the high-voltage battery is possible.

– Protect the high-voltage battery from direct sunlight.

- Open the fasteners of the transport box.
- Remove the cover of the transport box and remove using the bag with hollow glass granules.

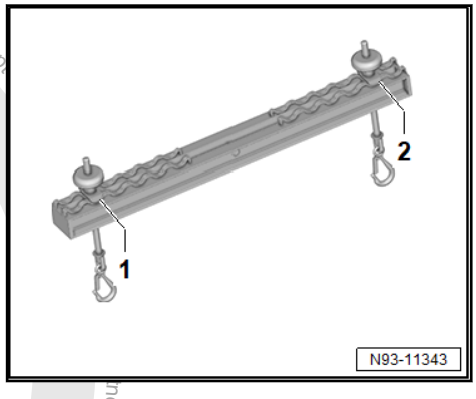
Amount of hollow glass granule is sufficient.

- Check the seal -1- and the pressure relief valves -2- for damage.



- Fill the transportation box with hollow glass granules to a level of minimum 200 mm.

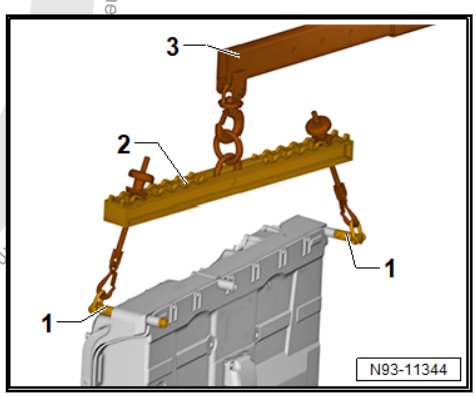
– Engage the Lifting Tackle - Spindle - 3033/8- on the positions -1- and -2- on the Lifting Tackle - 3033- .



Note

Align the High-Voltage Battery 1 - AX2- with the Adapter - T10542A- in one direction and the mount it lengthwise on the Adapter - T10542A- (for example if the battery contacts a perfectly flat surface).

– Engage the Lifting Tackle - 3033- -2- on the Shop Crane - VAS 6100- -3-.
– Position the Adapter - T10542A- -1- on the outer lifting eye and positioned toward the rear on the High-Voltage Battery 1 - AX2- and tighten to 20 Nm.

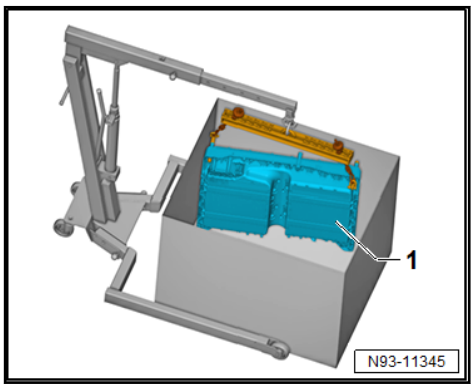


Note

- *On the Jetta High-Voltage Battery 1 - AX2- the frame must be removed beforehand. Refer to ⇒ Rep. Gr. 93 ; High-Voltage Battery Unit; Overview - High-Voltage Battery .*
- *If necessary, use the Shop Crane - VAS 6100- and Holding Strap - T40155A- to lift the Jetta High-Voltage Battery 1 - AX2- into the transport box.*

High-Voltage Battery, Packing into M-Box.

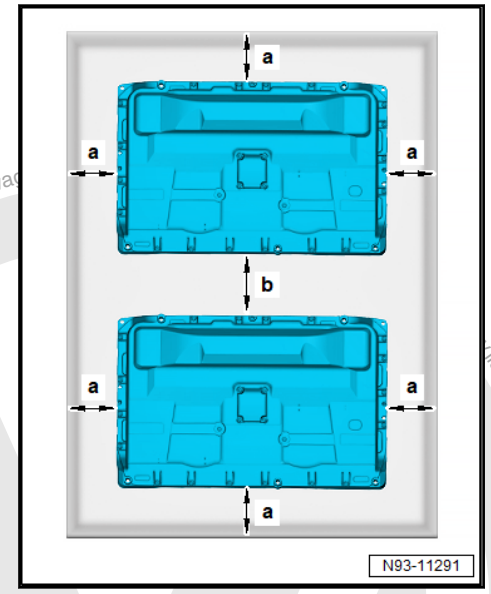
– Position the High-Voltage Battery 1 - AX2- -1- upright on the centered diagonally on the hollow glass granules.
– The distance to the inner walls must be at least 120 mm.



High-Voltage Battery, Packing into XXL-Box.

– When packing two batteries in the XXL-Box the distance of the batteries to the inner walls -a- must be at least 200 mm.

– The distance between the batteries -b- must be at least 200 mm.



Continuation for all

– Check if there is between the High-Voltage Battery 1 - AX2- and the upper edge of the transport box is a minimum 200 mm so a surrounding layer of hollow glass granules is free.

– Fill the hollow glass granules so that the open spaces as well as the entire transport box is filled to the upper edge.

Note

- *Pay attention that the surrounding rubber seal is not getting damaged.*
- *If the cover is difficult to close turn the cover 180° if necessary.*

– Place the cover on the transportation box.

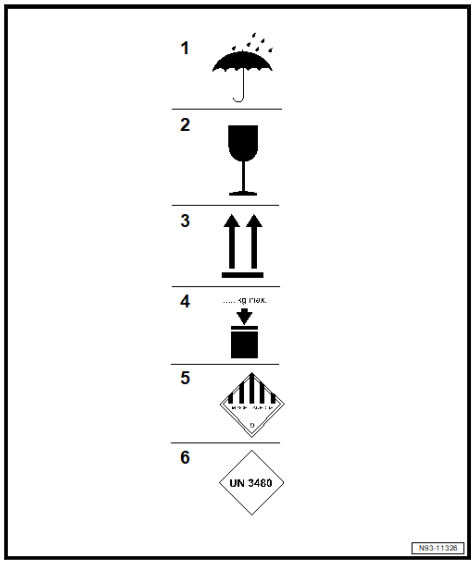
– Use the locks all around the cover to close it tightly, if necessary, re-tension the locks.

– Fill out and include the transportation documents.

– Attach the warning message for the dangerous materials and warning label on both long sides of the transport box.

- “Hazardous material class 9”
- “UN number 3480”
- “Attention! Lithium-ion battery damaged”
- “This side up”

Information about transportation preparation and hazardous material identification (Europe)



1 - “Protect from moisture”

2 - “Caution fragile”

3 - “This side up”

4 - “Stacking load limit”

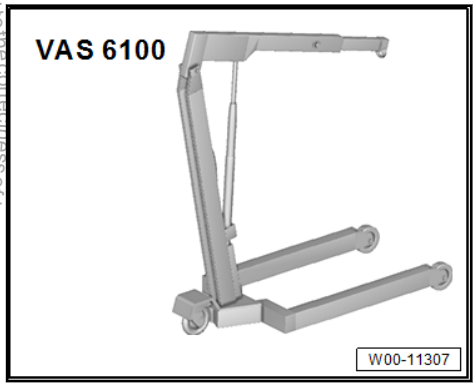
5 - “Hazardous materials label: hazardous materials class 9 “Different dangerous materials and objects””

6 - “Type label with UM-number UN3480 for lithium-ion batteries”

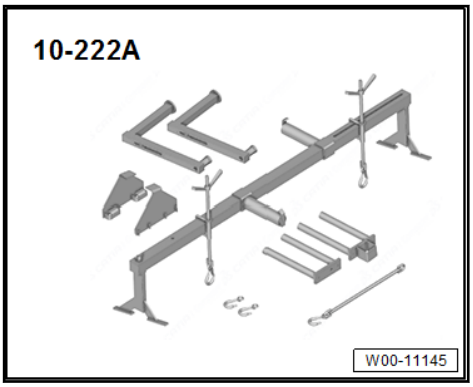
6.4.4 Packaging of Critical High-Voltage Batteries with “Warning” Status, e-Golf, e-Crafter, e-Up!

Special tools and workshop equipment required

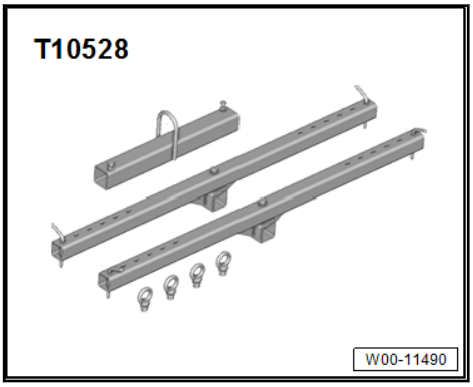
- Shop Crane - VAS 6100-



- Engine Support Bridge - 10 - 222 A-

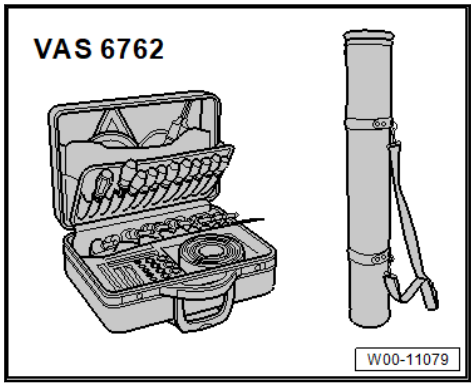


- Engine Support - Bracket w/Spindle and Hook - 10-222A/10- (quantity: 6)
- Engine/Gearbox Support Shackle (2 pc.) - 10-222A/12- (quantity: 2)
- Suspension Device - T10528-



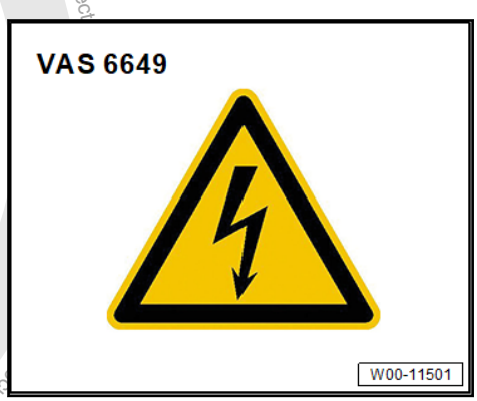
- Suspension Device - Securing Hole - T10528/3-
- Suspension Device - Lifting Eyebolt - T10528/5-
- Suspension Device - Supplement for Bracket - T10528/7-/10-
- Shackle - VAS 691 009A-

- High Voltage Tool Set - VAS 6762-



- Warning Sign - Battery - VAS 6786-

- Warning Sign - High Voltage - VAS 6649-



- High-Voltage Barrier (6 pcs.) - VAS 6884-
- Personal Protective Equipment
- Dust mask

DANGER

Extremely dangerous due to high-voltage.
Electrocution can cause death or very serious personal injury.
- **Wear ESD safe clothing.**
- **Wear an insulated helmet with face protection.**
- **Wear safety gloves.**
- **Wear protective footwear.**

WARNING

Health hazard due to dust of the hollow glass granules.

Irreversible impairment of the respiratory system due to dust particles in the lung possible.

– Wear a dust mask.

– Refer to ⇒ “6.1 High-Voltage Battery Classification”, page 22 .

Preparing the transportation packaging

Special transportation packaging is required for evaluated high-voltage batteries with “WARNING” status. The currently valid transportation determination applies.

For transporting high-voltage batteries in “Warning” status, the current valid transport determination also applies.

– Find a suitable transport packaging. Refer to ⇒ “6.4.1 Overview, Packaging”, page 48 .

High-Voltage Battery, Packaging

Packaging is described for the XXL-box as an example

– Protect all contacts from the High-Voltage Battery 1 - AX2- against short circuit.

– Seal all opening for the operating materials except for electrolyte.

– Remove any clinging hazardous materials such as electrolyte on the High-Voltage Battery 1 - AX2- .

NOTICE

Damage to the high-voltage battery is possible.

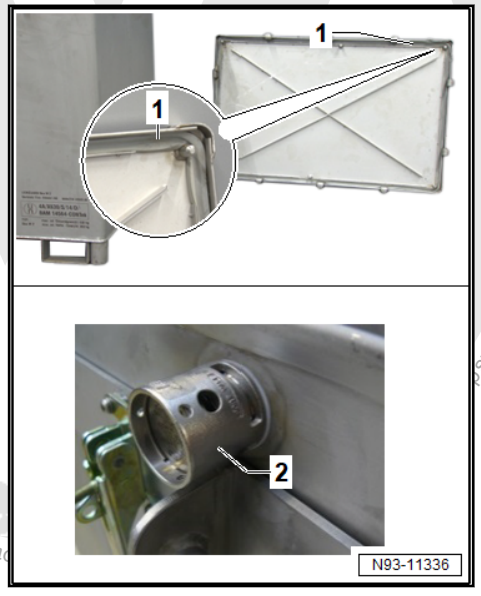
– Protect the high-voltage battery from direct sunlight.

– Open the fasteners of the transport box.

– Remove the cover of the transport box and remove using the bag with hollow glass granules.

Amount of hollow glass granule is sufficient.

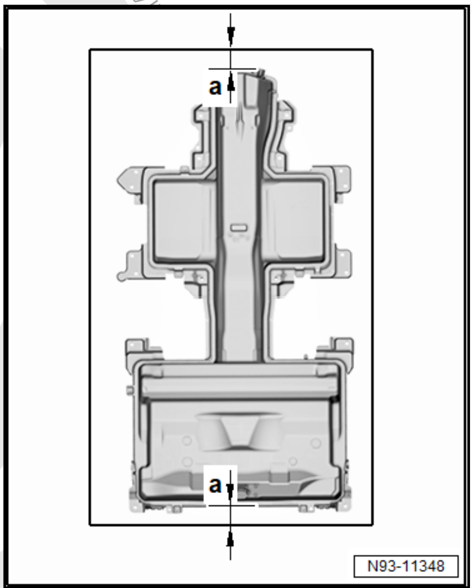
– Check the seal -1- and the pressure relief valves -2- for damage.



– Fill the hollow glass granules on the floor of the transport box up to a thickness of minimum 200 mm.

– Lift the High-Voltage Battery 1 - AX2- as described in the chapter. Refer to ⇒ “6.3 High-Voltage Battery, Packaging”, page 30 .

– Place the High-Voltage Battery 1 - AX2- in the transport box.



– Distance -a- to the inner walls and to the High-Voltage Battery 1 - AX2- must be at least 200 mm.

– Check if there is between the High-Voltage Battery 1 - AX2- and the upper edge of the transport box is a minimum 200 mm so a surrounding layer of hollow glass granules is free.

– Fill the hollow glass granules so that the open spaces as well as the entire transport box is filled to the upper edge.

Note

♦ *Pay attention that the surrounding rubber seal is not getting damaged.*

♦ *If the cover is difficult to close turn the cover 180° if necessary.*

– Place the cover on the transportation box.

– Use the locks all around the cover to close it tightly, if necessary, re-tension the locks.

– Fill out and include the transportation documents.

– Attach the warning message for the dangerous materials and warning label on both long sides of the transport box.

♦ “Hazardous material class 9”

♦ “UN number 3480”

♦ “Attention! Lithium-ion battery damaged”

♦ “This side up”

Information about transportation preparation and hazardous material identification (Europe)

1 - “Protect from moisture”

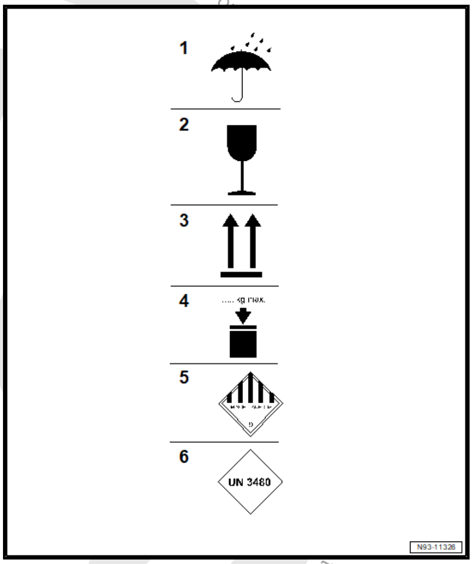
2 - “Caution fragile”

3 - “This side up”

4 - “Stacking load limit”

5 - “Hazardous materials label: hazardous materials class 9 “Different dangerous materials and objects””

6 - “Type label with UM-number UN3480 for lithium-ion batteries”



6.5 Additional Information for Opening and Bonding High-Voltage Batteries

Only applies to e-up! and e-Golf

DANGER

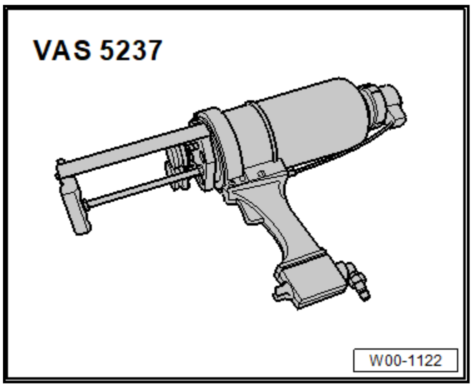
Extremely dangerous due to high-voltage.

Electrocution can cause death or very serious personal injury.

- Wear ESD safe clothing.
- Wear an insulated helmet with face protection.
- Wear safety gloves.
- Wear protective footwear.

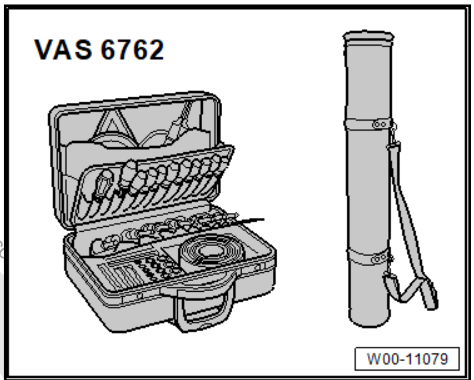
Special tools and workshop equipment required

- Double Cartridge Adhesive Gun - VAS 5237-

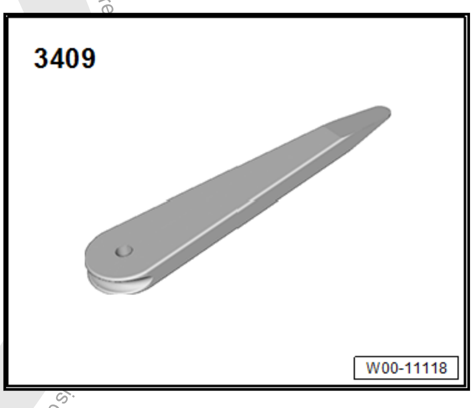


- Window Cutter - V.A.G 1561A-

- High-Voltage Battery Repair Tool Set - VAS 6900-
- High-Voltage Battery Repair Tool Set - Cutter - 27mm - VAS 6900/1-
- High-Voltage Battery Repair Tool Set - Scraper - 25mm - VAS 6900/2-
- High-Voltage Battery Repair Tool Set - One-Handed Clamp - VAS 6900/4-
- High Voltage Tool Set - VAS 6762-



- Trim Removal Wedge - 3409-



- Commercially available vacuum cleaner with a plastic nozzle

Note

Refer to the ⇒ Electronic Parts Catalog (ETKA) for the part number of the materials.

Special tools and workshop equipment required

- Two-Part Window Adhesive Set . Refer to [2].

- Cleaning Solution . Refer to 2).
- Applicator . Refer to 2).
- Glass/Paint Primer . Refer to 2).
- Activator . Refer to 2).
- Corrosion Protection for EMV Bolts . Refer to 2).
- Sandpaper/sanding pad (120-240 grit)
- Lint-free cleaning cloth

2) Follow the manufacturer processing instructions supplied in the packaging.

Opening

DANGER

Extremely dangerous due to high-voltage.

Electrocution can cause death or very serious personal injury.

– Have the high-voltage system de-energized by a qualified person.

DANGER

Extremely dangerous due to AC ≥ 30 V and DC ≥ 60 V voltage.

Electrocution can cause severe bodily or fatal injury.

– For the following procedures a second correspondingly qualified technician (minimum qualification technician trained in electrical systems and technician) must be present for the supervision.

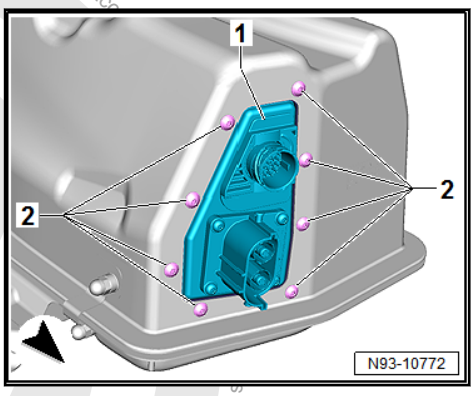
– The second technician may if necessary support the high-voltage expert within the limits of his/her qualifications.

– Pay attention to the country-specific requirements and laws.

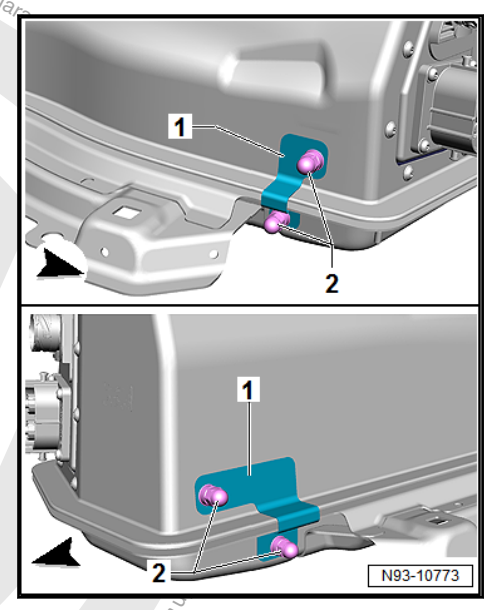
e-Golf procedure

– If equipped, remove the DC charging connection. Refer to ⇒ Rep. Gr. 93 ; High-Voltage Battery Unit; DC Charging Connection, Removing and Installing .

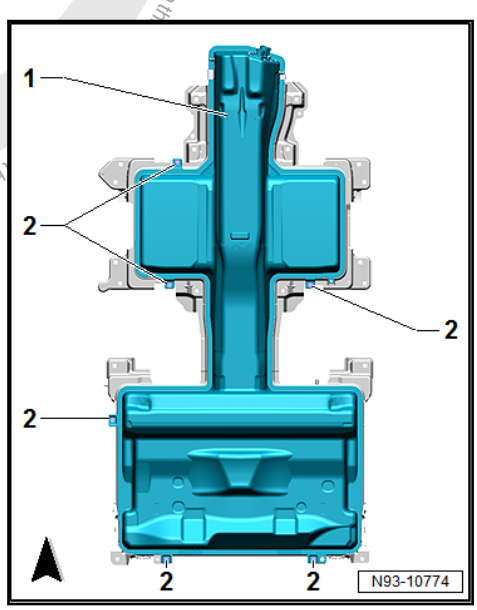
– Remove the bolts -2- from the connector mount -1-.



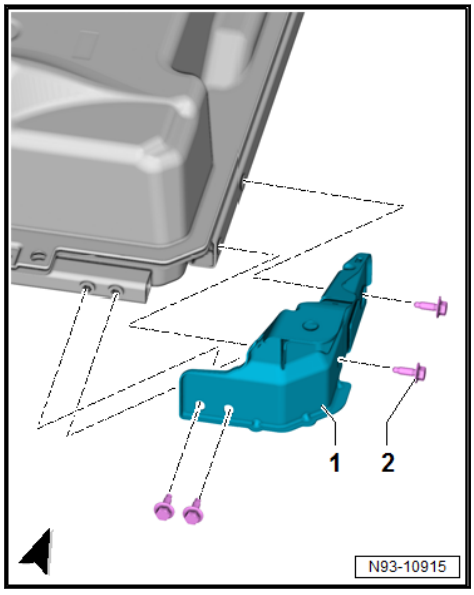
– Remove the nuts -2- from the ground tab -1- and from the high-voltage battery lower cover.
– Remove the ground bracket -1-.



– Remove the bolts -2- from the high-voltage battery upper cover -1-.



– Remove the bolts -2- from the left and right rear brackets -1-.
– Remove the left and right rear brackets -1-.



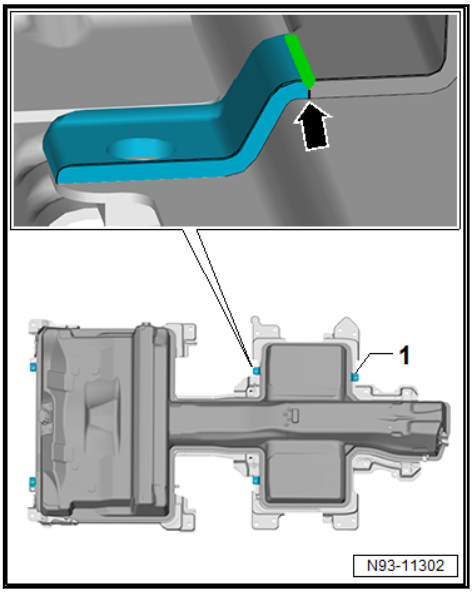
CAUTION

Risk of injury due to flying metal shavings.
Irritation and injury to skin and eyes possible.
– Wear protective eyewear.
– Wear safety gloves.

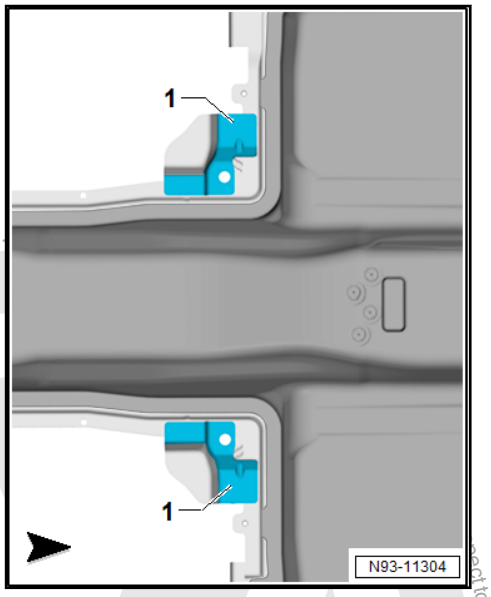
Note

Prevent cutting through the tab, as to not damage the paint on the bottom.

– Lightly cut into the tab -1- of the high-voltage battery using the Window Cutter - V.A.G 1561A- -arrow-.
– Break off the tabs -1- from the high-voltage battery.
– Fold the shield for the high-voltage battery upper cover upward.

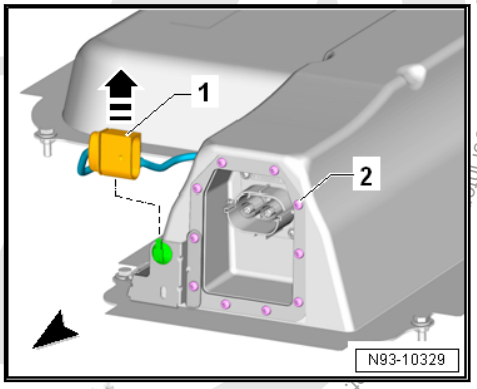


– Tape off the high-voltage battery lower cover in the area -1- with stable tape.

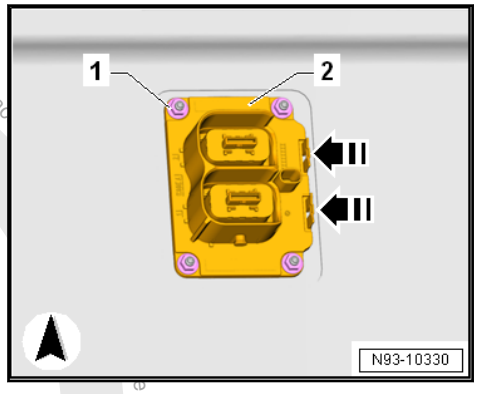


e-up! procedure

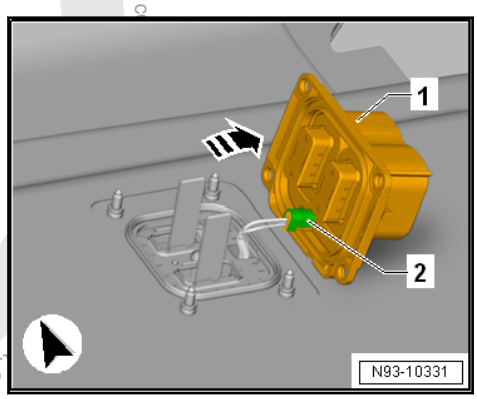
– Release the connector -1- in the -direction of the arrow-.
– Remove the bolts -2-.



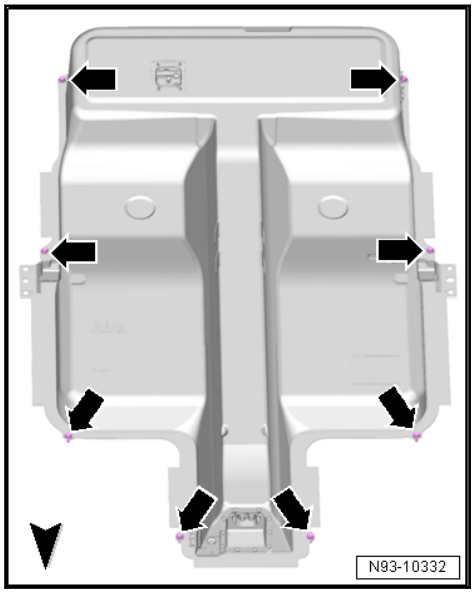
– Remove the nuts -1- from the charging port -2-.
– Unclip the charging port -arrows-.



– Turn the charging port into the -direction of the arrow-.
– Remove the retainer -2- to do so lift it on the sides and remove it outward.
– Unpin the two cables. Refer to ⇒ Electrical Equipment General Information; Rep. Gr. 97 ; Wires .



– Remove the bolts -arrows-.
– Lift the right and left stop buffer.



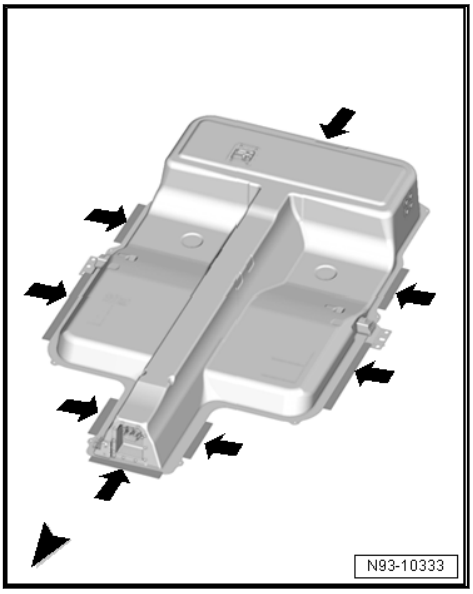
– Fold up the shield -arrows- approximately 90°.

Continuation for both vehicles

– Attach the High-Voltage Battery Repair Tool Set - Cutter - 27mm - VAS 6900/1- to the Window Cutter - V.A.G 1561A- .

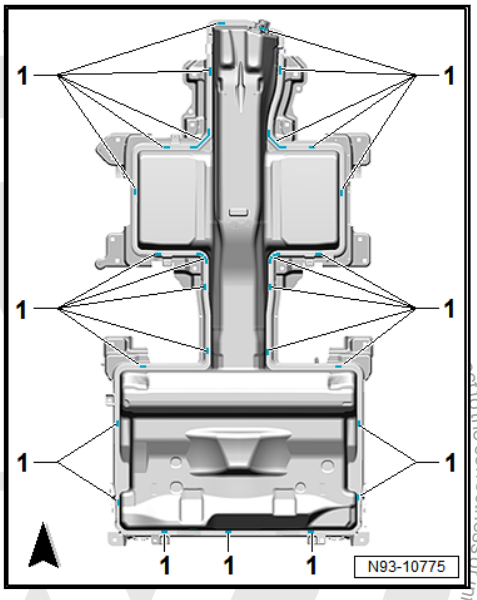
Note

- *There are spacers at regular distances on both high-voltage batteries.*
- *The spacers may not be cut through, to prevent slipping in the lower cover.*



Spacer overview on the high-voltage battery upper cover of the e-Golf

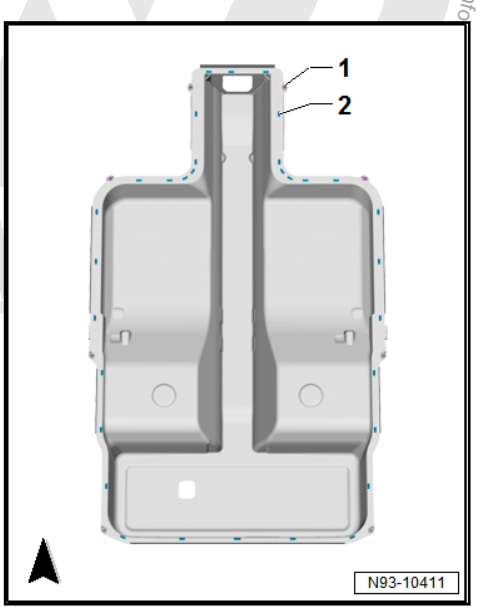
1 - Spacers in bond seam



Spacer overview on the high-voltage battery upper cover of the e-up!

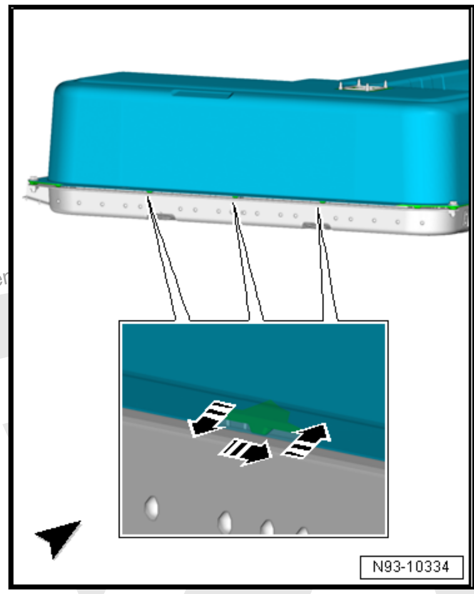
1 - Spacer on the threaded connections

2 - Spacers in bond seam

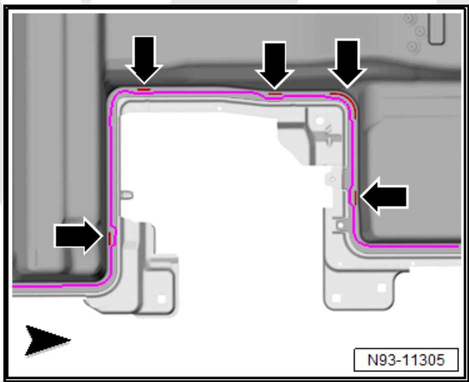


– In the area of the spacer remove the Window Cutter - V.A.G 1561A- from the adhesive seam -arrows-.

– Reinsert the Window Cutter - V.A.G 1561A- deeper into the bond seam -arrows- after the spacers.



Example guide the Window Cutter - V.A.G 1561A- around the spacer -arrows-.



NOTICE

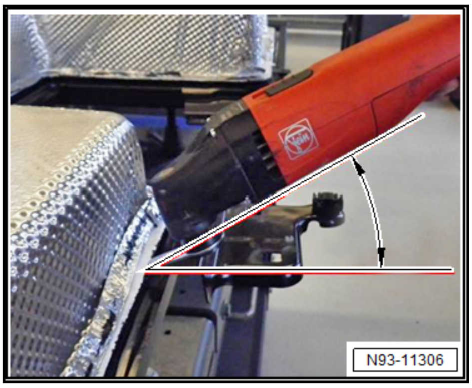
- Wear safety gloves, protective eyewear and ear protectors.
- Use both hands to hold the Window Cutter - V.A.G 1561A- at the back end.
- Always guide the Window Cutter - V.A.G 1561A- along the high-voltage battery upper cover.
- Follow the sequence when separating the bond seam to avoid moving the high-voltage battery upper cover.

– Set the speed on the Window Cutter - V.A.G 1561A- to 4.

NOTICE

- Prevent damage to the high-voltage battery lower cover.
- Due to the type of the blade the Window Cutter - V.A.G 1561A- is angles approximately 45° upward.

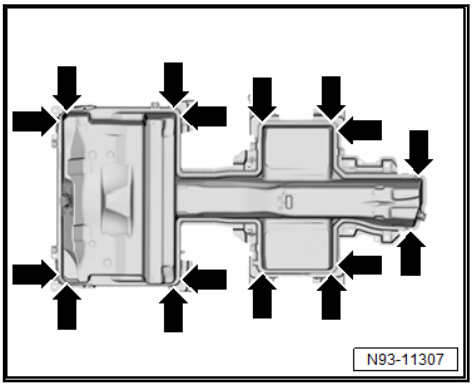
– Guide the Window Cutter - V.A.G 1561A- consistency with an even stroke -arrow- along the top of the high-voltage battery.



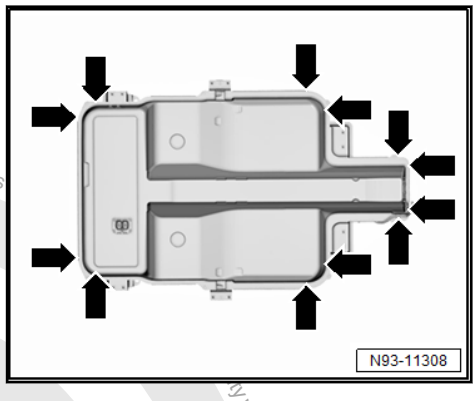
NOTICE

Only lift the high-voltage battery upper cover using the Trim Removal Wedge - 3409- on the specified positions, otherwise the mechanical and electric components, especially the battery modules will be damaged.

Mounting position of the Trim Removal Wedge - 3409- on the e-Golf high-voltage battery



Mounting position of the Trim Removal Wedge - 3409- on the e-up! High-Voltage Battery



– Lift the high-voltage battery upper cover.

– Lower the high-voltage battery upper cover with the help of a second technician, to do so grasp with both hands on the front and rear.

Bonding

Note

Ideally check the high-voltage battery upper cover directly after receiving.

– Check the high-voltage battery upper cover for damage (also fine cracks) because this can lead to leaks after bonding.

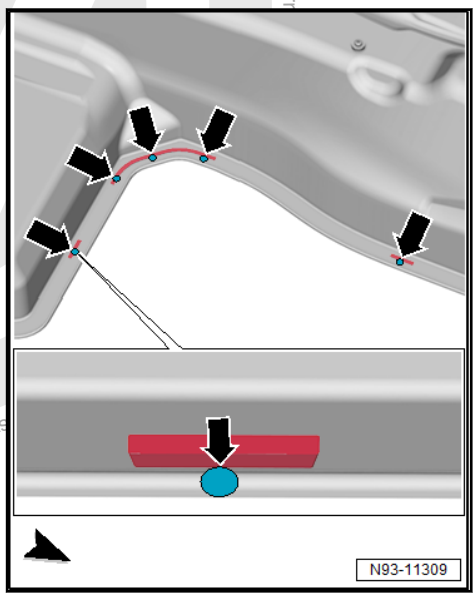
Prepare the high-voltage battery upper cover for bonding

– Mark the position of the outer spacer on the high-voltage battery upper cover -arrows-.

– For better bonding the Glass/Paint Primer , lightly abrade the upper shell in the area of the adhesive surface with sandpaper/sanding pad (120-240 grit).

– Thoroughly clean the upper cover from sanding dust and other contamination using a vacuum cleaner, lint-free cleaning cloth and Cleaning Solution .

– Do not touch the adhesive surface anymore.

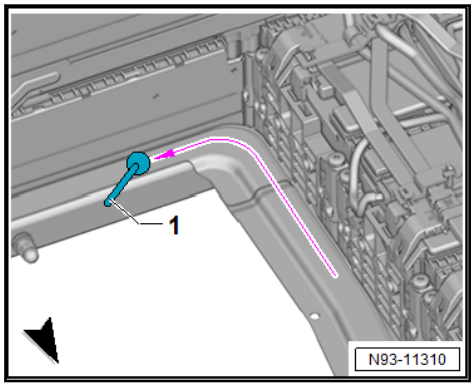


NOTICE

- **Let the Glass/Paint Primer dry. Refer to [3]. There must be no more wet positions present.**
- **Because the strength of Glass/Paint Primer strongly decreases after 24 hours, the bonding should take place ideal within two hours after the work orders. This also prevents the potential contamination.**
- **Applying the Glass/Paint Primer using the Applicator can then only take place in one direction (no back and forth).**

3) Follow the manufacturer processing instructions they are supplied in the packaging.

– Apply the Glass/Paint Primer using the Applicator -1- in the -direction of the arrow- carefully on the adhesive surface of the high-voltage battery upper cover.



Prepare the high-voltage battery lower cover for bonding

NOTICE

- **This process step should be performed shortly after bonding, because the bonding properties of the fresh cut-open adhesive seam is elevated.**
- **After cutting back the adhesive bead, it must no longer be touched or cleaned (fat, grease etc.).**
- **To prevent damage to the battery lower cover and to ensure proper adhesion of the new adhesive bead, the height of the old adhesive bead must not be less than 1 mm.**

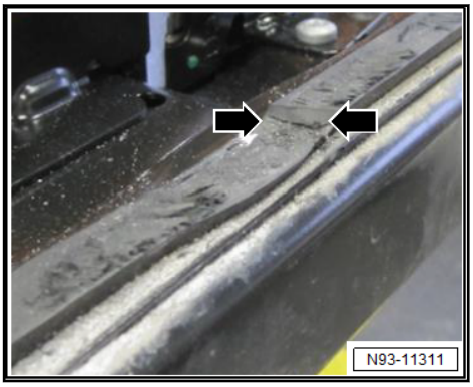
– Have a second technician pay attention to the correct height of the adhesive bead when cutting back.

– Hold the High-Voltage Battery Repair Tool Set - Scraper - 25mm - VAS 6900/2- straight while cutting.

NOTICE

Prevent overlapping and edges of the adhesive bead cause by re-applying the cutter.

– Cut-back the adhesive bead on the high-voltage battery lower cover using the Window Cutter - V.A.G 1561A- and High-Voltage Battery Repair Tool Set - Scraper - 25mm - VAS 6900/2- to 1 to 2 mm.



– If the adhesive seam -arrow- is cut-back to far of the paint surface is damaged, at this position the remainder of the adhesive seam must be removed and recreate the paint structure.
– Clean the high-voltage battery lower cover with a vacuum cleaner with a plastic nozzle, until the sealant material and dirt is completely removed.

NOTICE

- **Because when positioning the high-voltage battery upper cover an accidental contact with the adhesive bead must be prevented, it is recommended to try this step beforehand.**
- **Let the Activator dry (refer to 4)) before beginning the bonding. There must be no more wet positions present.**
- **Because the strength of Activator strongly decreases after 24 hours, the bonding should take place ideal within two hours after the work orders. This also prevents the potential contamination.**

4) Follow the manufacturer processing instructions they are supplied in the packaging.

NOTICE

Risk of damaging the paint with the activator.

– **Apply activator precisely on the adhesive bead and do not drip.**

– Apply the Activator on the cut-back adhesive seam.

Preparation Work before Bonding

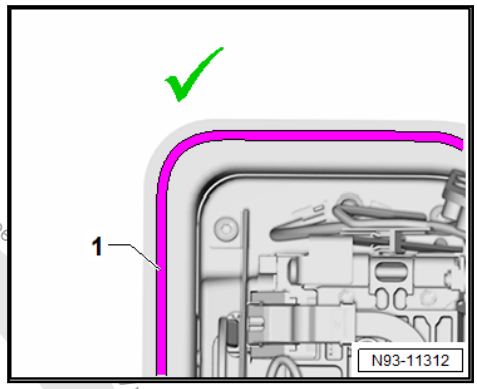
– Open the High-Voltage Battery Repair Tool Set - One-Handed Clamps - VAS 6900/4- and position them around the High-Voltage Battery 1 - AX2- .
– Prepare the bolts for the high-voltage battery upper cover.
– Prepare the required tools.
– Prepare and insert adhesive cartridge of Two-Part Window Adhesive Set by removing the metal base and pressing straight inward on the edge of the adhesive cartridge.
– Once multiple cartridge sets are needed, they must all be prepared beforehand, in order to not unnecessarily lengthen the bonding process.
– Insert the Two-Part Window Adhesive Set cartridge with the connection adapter in the Double Cartridge Adhesive Gun - VAS 5237- .
– Carefully press the Double Cartridge Adhesive Gun - VAS 5237- until both components (black and white) can be seen.
– Install the green mixing tip on the connector so that the opening points vertically downward.
– Push out a maximum 10 cm long adhesive bead, to ensure that both components are mixed.

High-Voltage Battery 1 - AX2- , Bonding

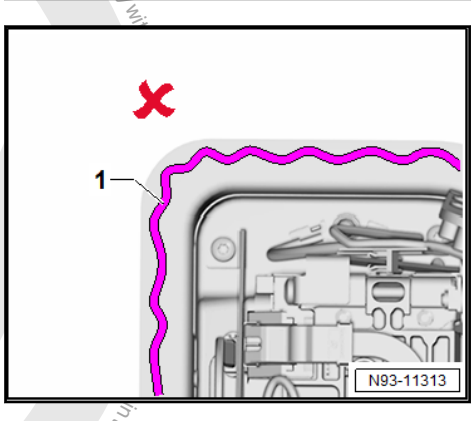
NOTICE

- **Use disposable gloves when bonding.**
- **Prepare a suitable object (for example scraper), to improve the adhesive seam in the follow-up.**
- **To shorten the time to apply the adhesive bead, it is recommended that two technicians apply the adhesive bead at the same time.**
- **The adhesive bead must not be applied too fast, otherwise it will be to thin and not significantly high.**

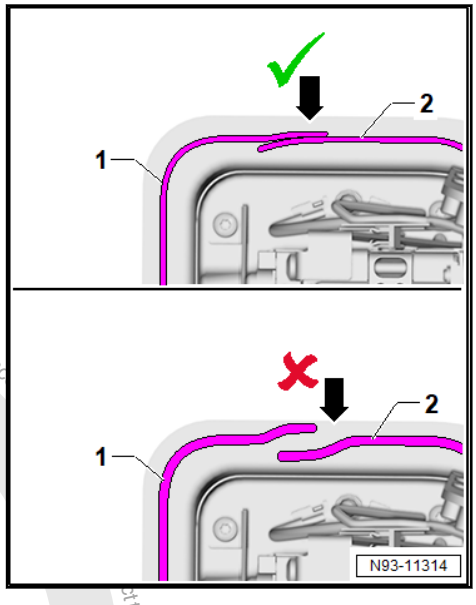
– Apply the adhesive bead -1- on the high-voltage battery lower cover at the same time pay attention to the correct speed.



By slowly applying the burr of the adhesive bead -1- will be wavy and can be pressed outward when positioning the high-voltage battery upper cover.



When re-positioning the adhesive gun pay attention that there are not any to large of gaps -arrow- between the adhesive beads -1- and -2- because these will be connected later.



- Follow-up by checking the adhesive bead.
- If necessary, clean the tip of the adhesive bead with a clean object.
- Straighten the wavy sections and connect the gapes.

NOTICE

- **Position the high-voltage battery upper cover within 10 minutes, because otherwise the adhesion of the Two-Part Window Adhesive Set will be impaired.**
- **When positioning the high-voltage battery upper cover pay attention not to accidentally contact the adhesive bead.**
- **Re-applying can lead to leaks.**

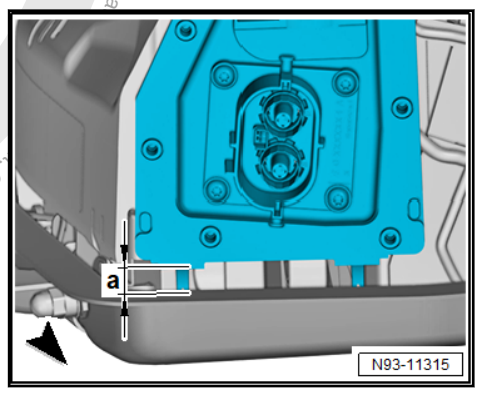
- Position the high-voltage battery upper cover with the help of three technicians.

On the e-Golf pay attention to the High-Voltage Battery 1 - AX2-

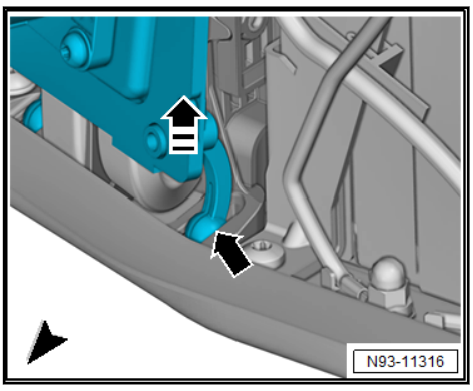
NOTICE

The adhesive seam must not be pushed when positioning the upper cover.

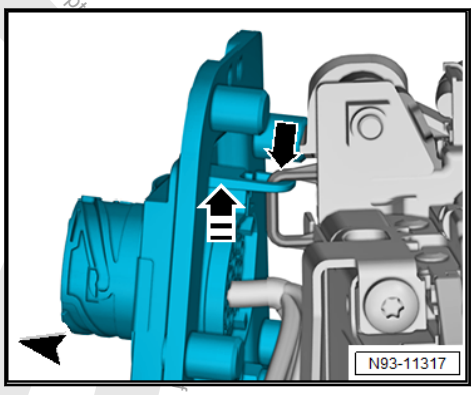
- Pay attention, that only limited space -a- is under the traction power connector.



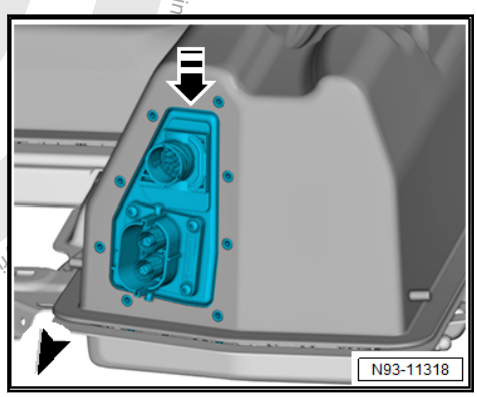
- Remove the traction power connector -arrow- slightly upward in the -direction of the arrow- out of the retainer.



– Secure the traction power connector mount -arrow-.



– Lightly position the high-voltage battery upper cover, bring the connector mount by lightly pressing in the -direction of the arrow- into the correct position.



Continuation for both vehicles

NOTICE

Securing using the High-Voltage Battery Repair Tool Set - One-Handed Clamp - VAS 6900/4- must take place after positioning the high-voltage battery upper cover.

– Secure the high-voltage battery upper cover centered on the EMV bolts on the tabs.

– Press on the high-voltage battery upper cover all around and evenly and by hand.

NOTICE

- **When incorrectly positioning the one-hand clamps small cracks can be created in the upper cover, which can lead to leaks.**
- **Do not tighten the High-Voltage Battery Repair Tool Set - One-Handed Clamp - VAS 6900/4- to tightly, otherwise it can be the case that the high-voltage battery upper cover is deformed or the adhesive seam gets pressed out.**

– Attach the High-Voltage Battery Repair Tool Set - One-Handed Clamp - VAS 6900/4- at the positions previously marked.

– Let the Two-Part Window Adhesive Set dry for two hours.

– Remove the High-Voltage Battery Repair Tool Set - One-Handed Clamp - VAS 6900/4- .

– Perform the leak test on the High-Voltage Battery 1 - AX2- . Refer to ⇒ Rep. Gr. 93 ; High-Voltage Battery Unit; High-Voltage Battery 1 1AX2 Leak Test .

Tightening Specifications

- Refer to ⇒ Rep. Gr. 93 ; High-Voltage Battery Pack; Overview - High-Voltage Battery .

Cautions & Warnings

Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.

- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.

- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized Volkswagen retailer parts department for the latest information.

- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the Volkswagen Factory Approved Scan Tool (ST).

- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is running.

- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.

- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it

- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.

- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.

- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid. Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.

- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.

- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual - replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.

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Cautions & Warnings

- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.

- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.

- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good repairs.

- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.

- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.

- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.

- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.

- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.

- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.

- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.

- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).

- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians should test, disassemble or service the airbag system.

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Cautions & Warnings

- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.

- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the Volkswagen Factory Approved Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.

- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.

- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

I have read and I understand these Cautions and Warnings.

back OK

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